

Functional F# Programming in .NET – A success story

Riccardo Terrell

Do you want to learn F# and Functional Programming? Well, you better start coding! Learning a new programming language is not easy, on top of reading a lot you need to practice even more. This workshop is designed to teach you some of the basics of F# and Functional Programming by combining theory (slides) and practice. As software becomes more complex, it is imperative to structure it well, to ensure that it is easy to write, debug, and provides a collection of modules that can be reused to reduce future programming costs. Functional Programming has been around for a while, but it is gaining popularity, especially due to direct support in languages on the JVM and the CLR. Writing code in functional style is not about syntax, it is a paradigm shift. In this presentation, using examples in F# and C#, you will learn how to write code in functional style. We will start out discussing the elements of functional programming and then look at examples of some common operations and how you can implement those in functional style.

Badge My IoT Life, Part 1

Paul Pagel

What can play games on the go, show your best face to the world, establish your geek creds way better than any iPhone, and potentially do some useful work too? Why, the "official" CodeMash 2020 IoT Badge of course!

In this workshop, you will construct your very own battery-powered WiFi-enabled badge based on the capable ESP32 microcontroller. You'll see a demo of the system and how it works, the key electronic components, and the basic techniques you'll need for assembly. Then it's time to dive right in and bring your badge to life. After that, you'll load up the provided testbench to make sure the hardware checks out and finally test drive some games and apps that you can use either as-is or as launchpads for your own awesome ideas.

Not only will you walk away with a cool piece of techno-bling to show the world, you'll also have a better understanding of how to build hardware projects of your own.

No prior electronics, soldering, or C/C++ programming experience is required. You must bring your fully-charged laptop and a micro USB cable to connect your laptop to the ESP32. Bringing your smartphone with a QR code scanning app on it is strongly suggested. All other hardware and tools will be provided at the session. Pre-requisite software and library installation instructions will be sent out before the conference. The goblins running the internet kindly request that you load these to your laptop prior to the workshop.

***Special note: an additional ticket purchase is necessary to keep the IoT Badge hardware that you will build in this session. Tickets will be available on Eventbrite a few weeks prior to CodeMash.

Hands On Threat Modeling Workshop

Robert Hurlbut

Threat modeling is a way of thinking about what could go wrong and how to prevent it. Instinctively, we all think this way in regards to our own personal security and safety. When it comes to building software, some software shops either skip the important step of threat modeling in secure software design or, they have tried threat modeling before but haven't quite figured out how to connect the threat models to real world software development and its priorities. Threat modeling should be part of your secure software design process. Using threat modeling and some principals of risk management, you can design software in a way that makes security one of the top goals, along with performance, scalability, reliability, and maintenance.

Objective: In this workshop, attendees will be introduced to Threat Modeling, learn how to conduct a Threat Modeling session, learn how to use practical strategies in finding Threats, learn how find realistic Countermeasures, and learn how to apply Risk Management in dealing with the threats.

This is a hands-on workshop. We will use whiteboards, Threat Modeling card games, look at some of the available Threat Modeling tools - all in order to get familiar with the latest approaches in Threat Modeling.

Bringing ML to Mobile Apps - Let's build an app to perform Face Recognition using Flutter

Don Ward

The Background Flutter is Google's cross-platform development framework for quickly crafting high-quality native apps on Web, iOS, Android, and ChromeOS in record time.

Flutter works with existing code, is used by developers and organizations around the world, and is free and open source. Notable apps written in Flutter include Abbey Road Studios first mobile app, Toplevel, the Hamilton Broadway Musical app, and Alibaba's Xianyu mobile app.

Firebase is Google's set of back-end services for mobile developers to quickly build out mobile apps for both Android and iOS. It is a set of 17 services that currently support 1.5 million mobile apps. The services range from Push Notifications, and Remote Configuration, all the way to supporting best in class Machine Learning models for use in mobile apps.

To illustrate how powerful the combination of Flutter and Firebase is, we will be building a cross-platform mobile app to perform face-recognition in real-time from the device's camera.

In this workshop we will develop this app using one codebase written in Flutter hooking into Firebase's APIs. Face recognition will be performed using a pre-built machine learning model built by Google and provided within Firebase. This machine learning model will run on the mobile device providing real-time detection with no network latency. The mobile app we will build can easily be extended to support many other types of Machine Learning models including custom models.

How will we do this? In this hands-on workshop, we will start from scratch with no expectation of prior knowledge of Flutter.

Below is the schedule for the work-shop,

30 minutes - Intro to Flutter
30 minutes - Set up the Flutter development environment on attendees computers
30 minutes - Start coding the UI for the project step by step
15 minutes - Break
30 minutes - Finish off the UI for the project
30 minutes - Intro to Firebase
30 minutes - Setup Firebase for the project
30 minutes - Add the code to support Face Recognition from Firebase MLKit to the project
30 minutes - Celebrate! Wrap-up and questions

This entire workshop and all steps will be available beforehand as a GitHub repo. A example of how I plan on structuring the source code and the presentation can be found here -> <https://github.com/donwardpeng/Flutter-DetTechWatch>)

What will attendees walk away with? The goal is for everyone to walk away with the understanding of how to build a mobile app that runs machine learning in real time (specifically face recognition). Additionally, at the end of the session, everyone should be have a working codebase for this app.

Putting the D&D in TDD

George Walters II, Guy Royse

Are you tired of TDD workshops that make you do boring things like calculating bowling scores and prime factors or demonstrate how to win the game of life? If so, this is the session for you! In this TDD workshop, we will be building the domain model for EverCraft -- a new MMORPG from Blizzards of the Coast. We have lots of story cards prepared to cover features from combat to magic, classes to spells, and races to items. Plus, we'll be defining some of these cards during the session in case you want that +9 knife of ogre slaying or enjoy casting magic missile at the darkness.

This workshop is language agnostic and for all levels of developers. The focus is on TDD and emergent design but pair programming will be covered as well. The only requirement is that you bring a laptop and that you be able to test-drive your code with your language of choice. When you are done you will emerge a better programmer for the experience but there is a small chance you will have a craving for Cheetos and Mountain Dew.

Design & Research Fundamentals for Developers

Alex White

How do you know what you're building is important to your customers? As a developer, it's easy for you to jump right into the code when given a problem to solve, but what if you build something that nobody wants? Taking the time to design and research your product can help you better meet the needs of customers while avoiding potential rework down the line. This hands-on workshop will present you with a problem that needs solving and guide you on researching, designing and prototyping a solution. You will work in a small group to evaluate the problem and design a solution. Your group will turn the design into an interactive prototype and conduct usability studies to ensure you're meeting customer needs. Finally, your group will iterate on the design and present your findings to a stakeholder. At the end of this workshop, you will have the fundamentals needed to research and design the solutions your customers want. You will also learn tactics for selling the value of design and research to your client, and how to best present your research results.

Build your first full-stack Blazor app

Ed Charbeneau

The arrival of WebAssembly begins a new era for .NET web developers, allowing client-side applications written in C# to run directly in the browser. Blazor is a newly emerging client-side UI platform from the ASP.NET Core team, offering a productive and powerful way to construct large-scale applications with a modern component-based architecture. It integrates with the wider .NET ecosystem to enable truly full-stack client+server development on a single language and runtime, based on modern standards, and able to run in any browser (including mobiles).

This workshop will quickly take you from getting started with Blazor basics, right through to building sophisticated UIs using more advanced framework features. We'll explore not only the capabilities of Blazor and WebAssembly today, but also the longer-term vision for the future of web apps on .NET.

Arts & Crafts with AWS Glue Workshop

Lydia White, James Zhang

Constructing and administering a big data scale Extract, Transform & Load (ETL) and Business Intelligence (BI) pipeline can be expensive and complicated. Fortunately, Amazon Web Services (AWS) simplifies this with Glue and QuickSight services. Glue, a fully managed, serverless and cloud-optimized ETL service, ingests data from files or databases. QuickSight, a BI tool, provides data analysis and insights on the ingested data.

In this hands-on workshop, you will start by using Amazon's S3, Athena and Redshift services to store and access data. You will utilize Glue, Python and PySpark to transform data into the desired formats and data sources. Finally, you will learn how to enable business users to make better decisions with QuickSight's drillable dashboards.

Introduction to Kubernetes

James Strong

Introduction to Kubernetes is a hands-on, interactive workshop giving attendees a thorough understanding of the fundamentals of Kubernetes. As part of this workshop, you will learn how Kubernetes works, deploy

microservices to that cluster & also hear about some war stories.

Hacking Your Emotional API: Emotional Intelligence in Practice

John Sawers, Aaron Aldrich

Being a good developer isn't just about slinging code; we're part of a community. Interacting with others in a community means feelings are involved.

But feelings are messy and uncomfortable, so why can't you just ignore them? Because emotional skills are critical for working well on a team.

You may have heard that emotional intelligence is correlated with career success, but wondered just how to build those skills. In this workshop you will get to practice working with:

- Your API - using the metaphor of an API to understand the foundations of how emotions work
 - Observability of ourselves - check in on yourself and better understand what happens below the surface
 - Observability of a group - share your state with others
 - Inter-Process Communication: emotions and experiences shape your motivations and create blockers for you
 - Troubleshooting - When interpersonal communication goes wrong, how to restore relationships and communication to work together again
-

PreCompiler Session 02 - Tuesday 1:00

Codemash VoiceHack 2020

Jeff Blankenburg

This is a pre-compiler for learning how to build voice applications using Alexa. We will cover things like intents, sample utterances, handlers, and voice design principles. You'll learn how to use AWS Lambda functions, talk to APIs, and even how to make some money.

But this is also a kickoff to a voice hackathon that will last for the entirety of Codemash 2020. Build your best ideas, visit our team of experts to ask questions during the week, and enter your skill to be judged on Friday afternoon. Prizes will abound, and you'll have a new skillset on your toolbelt.

Come join us! It will be a blast!

Tech Debt Be Gone! Time to Refactor JavaScript

Joe Morgan, Laurie Barth

It's been a battle, but the code is finally working. It's time to clean it up, but not so fast, something else is on fire and the code has to be pushed as it is. Whenever there is time to refactor something else comes up. Of course, this doesn't just happen once. A quick change here. A little hack there. Now it's spaghetti code and everyone is terrified of opening the file and even more afraid that someone else will see it.

Refactoring can feel like an insurmountable task, but it doesn't have to be. Participants in this workshop will learn a mental framework for refactoring that will give them the tools to attack their technical debt head on.

Participants will start with a project that mirrors many typical code problems. Next, they will learn to develop tests that will give them the confidence they need to change their code without breaking functionality, or introducing new bugs. Then they'll learn how to break down code down into smaller, refactorable pieces. Finally, they'll get to work on the sample project so you can test out these techniques for themselves. When they head back to work, they'll be ready to handle anything that legacy code can throw at them.

Badge My IoT Life, Part 2

Paul Pagel

What can play games on the go, show your best face to the world, establish your geek creds way better than any iPhone, and potentially do some useful work too? Why, the "official" CodeMash 2020 IoT Badge of course!

This session will use the badge created in Part 1 and take a closer look at hardware troubleshooting techniques, considerations for adding sensors or other components, and the tools and strategies you can use for creating your own microcontroller-based projects. We'll start with the apps introduced in the morning session, and then personalize them to be uniquely yours. Want to be a 1920's gangster? A magical prison escapee? A data-driven mad scientist? This session will provide the tools to take your badge to the next level!

Badge My IoT Life, Part 1 is a pre-requisite. Bring your laptop, smartphone, and some basic photo editing software. Prior coding experience with a C-based language is helpful, but not required.

***Special note: an additional ticket purchase is necessary to keep the IoT Badge hardware that you will build in this session. Tickets will be available on Eventbrite a few weeks prior to CodeMash.

iOS Application Security Testing

Hans Weisheimer

This hands-on session is aimed at mobile app developers, QA testers, aspiring security testers, and other suspicious persons.

Modern mobile app development abstracts away most low-level interaction with the operating system. It is common to rely on third-party modules to handle sensitive data or perform critical tasks. What really happens when an application's state is updated? Or biometric authentication requested? What are the analytics packages talking about behind your back? Mobile platforms (and iOS in particular) tend to make introspection difficult, .

You will learn how to look under the hood of a running application, using open source tools and unmodified devices. Topics include: - Packaging and instrumenting an application with Frida - Monitoring and manipulating HTTP traffic - Browsing the application's files, databases, and Keychain entries - Lying to the application with hooked functions - Easy mode w/ virtualization - Occasional Android comparisons - Thoughts on automation

Students must bring a laptop, with MacBooks being strongly recommended. Windows instructions will be provided, with some limitations. Please arrive with the following tools installed: XCode w/ command line tools, iTunes, NodeJS 10.x, Python 3.x (plus virtualenv), an OpenVPN client, and an intercepting proxy of your choice (OWASP ZAP, Burp Suite, Charles Proxy, etc). Students will be provided access to virtualized iOS devices.

After completing this workshop, students will be able to inspect their iOS applications for common security flaws. This includes the ability to inspect and manipulate an application's network traffic, files, and function calls.

Hadoop Essentials

Eric Richardson

Big Data and Cloud platforms have their origins in Hadoop. Learn the fundamentals of HDFS, Map Reduce and Yarn the three core components of Apache Hadoop. You will start a sandbox cluster, interact with HDFS, learn how HDFS saves data and why it does it that way. MapReduce is an important processing paradigm, learn why and explore some of the Computer Science theory behind the technology. Write a simple MapReduce job, old school but effective. YARN is brains behind massive data processing jobs. Learn how it makes decisions and watch it run your MapReduce job.

Building a Full CRUD Application in Excel with VBA and SQL Integration

Derek Mulhausen

In this talk, we will build a full application from scratch in Excel to store customer discounts in Excel. We will start with recording a macro to quickly prototype some of our actions and then dig into the underlying code to polish the formatting and produce a product that can be put into production. Through this process we will link to a SQL Express database and learn how to programmatically build form controls and place them on a worksheet.

Prerequisites: Basic knowledge of SQL is recommended but not required. Excel with VBA(Windows is best as VBA for Excel on a Mac has some limitations) SQL Server Express

Get Up and Running Quickly With Vue.js

Burton Smith

Whether you are enhancing a legacy application or starting a greenfield project, Vue.js can help reduce your development time. Vue.js a very lightweight and fast JavaScript framework that makes it ideal for modern applications - from using it as a library to create some enhanced features in your existing applications, rapidly prototyping a proof of concept, or using it as complete SPA framework in order to create fast, scalable solutions.

In this session, we will show you how to get started with Vue.js - both as a library and as a framework. You will also get a chance to learn how to quickly scaffold out projects using the Vue CLI and UI tool.

Xamarin Forms Workshop

Jason Awbrey

Interested in learning more about Xamarin, but not sure where to start? This workshop will give you a guerrilla introduction to the Xamarin platform, including live coding exercises in building a cross platform app with Xamarin Forms.

We'll discuss the overall Xamarin ecosystem and the sometimes confusing distinction between Xamarin Platform and Xamarin Forms. We'll do an extensive hands-on lab where we build a working cross-platform app with Xamarin Forms. And we'll discuss the pros and cons of Xamarin's approach to building apps. And we'll make plenty of stops along the way to answer your questions.

Reactive Extensions Without Marbles

Eric Smith

ReactiveX is an exciting technology that's rapidly becoming pervasive, with implementations in Java, Swift, JavaScript and more. It has use cases from asynchronous calls to UI development, but unfortunately most tutorials and explanations are filled with theory and marble diagrams. Trying to get started with the tech can be both tantalizing because it sounds great, and difficult because the use cases aren't clear.

In this workshop we'll take a hands-on approach to learning Rx, using TypeScript for widespread applicability. We'll start with simple use cases and build up to complex and dynamic UIs. As we do we'll see how Rx can make your application both easier to write and easier to read.

GIT: From beginner to Fearless

Brian Gorman

This training is an introduction to GIT for source control. We'll take a look at getting started with GIT on our own machines, as well as working with GIT at public/private repositories on GitHub and/or BitBucket. Tools we'll use include BASH and VSCode

GIT can scare people. It shouldn't. GIT is awesome, and it's something that everyone should be using - it can even be used for more than just code [yes, you can version documents and spreadsheets]!

This workshop is primarily geared towards those who do code in any language and/or do web development with any tech stack, however learning the basics and commands of GIT can benefit anyone.

The workshop will cover practical scenarios needed for anyone in a normal GIT workflow, how to interact with other developers, and ends with how to solve some more tricky problems that happen.

By the end of the day, you should no longer have any fear about wrecking your repository or losing your changes.

The workshop general outline will look something like this:

Getting Started Git Basic Info A single-person/developer general flow A simple multiple-person/developer flow Advanced GIT commands to rescue your material Release Management Using GIT from Visual Studio or Eclipse

Let's play!

Jean Lange, Remy Porter

Improv games ~ZIP!~ build skills like paying attention ~ZAP!~, switching roles ~ZOP!~, negotiating uncertainty ~...zzZIP?~, and celebrating failure ~ZOP! HURRAH!~

... and these skills build up to real world benefits like understanding the people around you better, working well in a group, and not being fazed by initial failures.

No experience is required, just readiness to jump in. You'll meet people, learn activities that you can take back to your teams/families/friends, practice and reflect on a variety of skills, and walk out full of joy and energy. Come play with us!

Kubernetes hands-on (Workshop)

Rob Richardson

Kubernetes is how you run Docker in production. Bring your laptop with Docker for Windows or Docker for Mac edge version installed. We'll walk through getting a K8s cluster fired up on Docker-Desktop, minikube, and on Azure. You'll be hosting Docker containers in development and production in no time. We'll dig deep into:

- A quick tour through Docker concepts
- The components of a kubernetes cluster
- pods, services, deployments, and replicas
- ways to scale and expose/isolate your containers
- public and private container registries
- stateful containers
- promoting from development to production
- Azure Container Service (AKS)
- Best practices for building at cloud scale
- Tips & Tricks for leveraging Docker and Kubernetes
- When not to use Kubernetes

We'll look at the commands and ecosystem around building infrastructure as code, local and cloud clusters, and best practices with containers. Come see why devs and ops love Kubernetes.

PreCompiler Session 03 - Wednesday 8:00

Building an educational game with .NET Core and Unity3D (Workshop)

Johnny Hooyberghs

If you are waiting for a deep dive into .NET Core, the Microsoft Compiler Platform and Unity3D this workshop is for you! No high-level tech demos, but a real-life application that is used in schools. Building an educational game, with robots fighting to the death, from scratch, will be a blast. This will include backend web services, a frontend Unity client to visualize the battle and middleware processing services using the Microsoft Compiler Platform (Roslyn). The point of this workshop is to show how technology is evolved to make development easy and create useful applications in only a few hours of hardcore coding. At the end of the workshop, the finished game can be actually played!

Kafka: Build, Deploy, and Monitor Your First Real-World Application

Justin Pihony

Companies nowadays are finding it critical to be able to gather and analyze massive amounts of disparately-sourced data, quickly and reliably. By diving into the fundamentals of Apache Kafka, you will learn how it can be more than a superior, distributed messaging system, but also a platform to handle all your stream processing needs. In this session, we'll start by reviewing the basics; topics, producers, consumers, and beyond. Then discover how to operationalize data pipelines, easily maintaining and monitoring them throughout a full production lifecycle. After completing this session, you'll have learned how to use Kafka for many of your data needs, merging the worlds of data consumption, processing, and devops.

Building Quality JavaScript With Test-Driven Development

Steven Hicks

Learning Test-Driven Development (TDD) is frustrating. The first couple tests feel strange - you wonder why you're writing tests that fail on purpose. Before long, you find yourself behind schedule from spending so much time on tests. You abandon unit testing completely. You'll write them after....if you find the time.

This workshop will ease the frustration of learning Test-Driven Development. We'll discuss the fundamentals of TDD and work together to solve problems in a test-driven manner. You'll build confidence in your ability to apply TDD in JavaScript with hands-on experience.

Topics and activities include:

- Instruction and exercises that will familiarize you with Jest as a JavaScript test framework
- An introduction to the fundamentals of TDD
- An instructor-led demonstration of TDD in practice
- A collaborative code kata to get a hands-on, practical introduction to TDD
- A series of hands-on exercises writing test-driven JavaScript code
- A discussion of best practices for keeping your JavaScript test-friendly

We'll be using Jest to build quality into our JavaScript code from the start. No specific UI framework will be targeted in this workshop - we will focus on writing and testing pure JavaScript. The experience you gain will be applicable to any JavaScript-based app, regardless of your framework allegiance.

Participants should be able to read and write JavaScript, as no time will be spent on language details. General familiarity with writing unit tests in any language is required. Familiarity with Test-Driven Development is helpful but not required, and no TDD experience is necessary. No experience with Jest is necessary.

A laptop with the LTS version of NodeJS installed (currently 10.16.3) is required. The corresponding version of NPM (currently 6.9.0) is also required. Detailed setup instructions are at <https://stevenhicks.me/tdd-setup>.

Making Reality Virtual: Simulating Experiences with VR Prototyping

Scott Showalter

Take the Red Pill, and let's dive into the mind-bending Matrix that is Virtual Reality prototyping. Not just for gaming (though that's cool too), a new dimension of experience simulation is now open to designers of software as well as physical products, to observe customer interaction and gather feedback without ever having to create a real product. In this session, explore the hardware and software tools, and the varying techniques we can leverage to put potential customers into a world unlike anything they're used to, or even places they're already familiar with. Learn how to observe their interactions with those experiences, empathize with them in specific contexts and better understand their behaviors. Discover how we can help solve problems or create new engaging content that fits their needs with this new virtual realm. Finally, learn how to validate physical product ideas, not just software and games. Walk away with everything you need to get started prototyping VR experiences (except the hardware itself).

The Demystifying Docker and Kubernetes DOJO

Barry Tarlton, Michael Frayer

Want to be able to go from code to containers and then to a fully resilient, cluster managed environment like Kubernetes? Then this session is for you! This session will start with your code (or ours if you don't want to bring your own) and take you through the steps of packaging it as a container through building your own Dockerfile. You will kick the tires of your application in your newly built docker container and learn how to test and troubleshoot the container before moving it to Kubernetes. Learn to run your containers in Kubernetes via simple CLI commands as well as how to create robust and re-useable configuration yamls to handle the deployments for you. How do you handle securing passwords and externalizing configurations? How do you scale and provide load balancing? This session will teach you to handle those scenarios and many more! Pods, Deployments, Services, and Ingresses will all be at your beck and call when you leave this session!

Building Declarative UI with SwiftUI

Jeff Kelley

At WWDC 2019, Apple shocked its developer community with the announcement of SwiftUI—a brand-new, declarative UI framework for all of their platforms. In this workshop, we'll build a brand new app from scratch with SwiftUI that can run on all of Apple's platforms: iOS, macOS, watchOS, and tvOS. Bring all of your devices and get ready to do a deep dive into SwiftUI and all of the new language features in Swift that make it possible!

Workshop: JVM Application Monitoring with Micrometer, Prometheus, and Grafana

Andrew Fitzgerald, Nathan Zender

Tired of waiting for reports from users to let you know your application is having performance issues? If you're looking for a way to increase visibility into your application beyond plain text logs, this is the pre-compiler for you!

In this half-day, hands-on workshop you will receive an in depth introduction to a suite of open source tools that you can use to monitor the performance of your applications and the infrastructure they run on. While the application and instrumentation library used in this session will be JVM oriented, many of the tools and concepts will be transferable to other languages.

Micrometer is a Java metrics library from Pivotal (and the default metrics library for Spring Boot) that allows you to instrument your application once and export metrics to many popular monitoring systems.

Prometheus is a monitoring and alerting tool that allows you to easily store and query your application metrics with minimal operational overhead.

Grafana is a visualization tool that allows you to easily generate and manage beautiful graphs and dashboards from data stored in Prometheus (as well as many other backends).

Decision Making in the Face of Uncertainty

Gary Short

Decision making in the face of uncertainty is one of the hardest things to do. In this pre-compiler session, we'll borrow methods from machine learning, statistics, trading and computer science to compose a methodology which will allow you to make the best decision possible given the evidence you have to hand, and to also hedge against you being wrong. Whether you're a "techie" or a "civilian" everyone can benefit from learning this important methodology

Get Progressive with it

Matthew LaForest

Responsive web design! Mobile first! Hybrid apps! We are continuously bombarded with new ideas about the best way to develop a new application. For a small team, effectively delivering across many platforms can be a problem, but delivering a hybrid app frequently falls into an uncanny valley trap.

Enter Progressive Web Apps, your website now is truly installable as an application on a mobile device. Progressive web apps leverage newer Web APIs to allow you to interact on a deeper level with your client including offline support, notifications, and more. Learn the techniques for building a Progressive Web App, the new design considerations you should take into account when doing so, and how it lets you iterate quickly on new ideas.

From Particle to Alexa

Brandon Satrom, Jeff Blankenburg

In this 4-hour workshop, you will get to work with the two teams behind Particle IoT hardware and Amazon Alexa to build and code your own IoT device, which you can then command with your own Alexa skill.

Come learn about how to command IoT devices, add and measure sensors, and use Particle's rich set of APIs to build your next cool, connected solution.

You'll also learn how to create your own software for Alexa that can voice enable your new devices, using Node.js, the Alexa SDK, and a wide-array of design and development tools.

Application Security, Basic, Intermediate, Advanced

Bill Sempf

Bill will be joining us to teach a dynamic course to help us think like an attacker and give us all the coding tips we need to stop them cold in their tracks. Even the most experienced developers are sure to pick up some new tips and tricks. This hands-on half-day workshop will have something for everyone. Before we start, there will be some setup for labs and tools – so plan some time in advance and bring your Windows, Macintosh, or Linux laptop!

We will cover problems and solutions as they relate to application security and principles of application security Demo a purposefully vulnerable web application, and work with tools. Then we will cover some specifics, at a pace for everyone!

Authentication: Covers all aspects of secure authentication, including building secure login screens, password storage, secure interactions between sites, and an overview of many other topics.

Injection: SQL, command, LDAP injection, just to name a few. Sending your commands to a backend system

Browser attacks: Finding and exploiting cross site scripting vulnerabilities

It will be easier if you bring a basic understanding of HTTP protocols and web applications. Set up the Juice Shop application with instructions from the precompiler site. Install Burp Suite Community Edition from Portswigger.

PreCompiler Session 04 - Wednesday 1:00

Java 9, 10 & 11 Workshop

Christopher Judd

With the quick moving 6-month Java train releases, you like many Java developers and organizations may have remained on Java 8 waiting for the next Long-Term-Support (LTS) release. Well, Java 11 is here so it is time to begin the adoption and upgrading. Java 9 was a HUGE release with many impactful features like the module system, jLink, jShell and a hand full of new Project Coin language features. While Java 10 & 11 were small in comparison based on feature count their influence will be felt. The var keyword, Graal and container awareness features along with lambda, thread and garbage collection enhancements will improve development and operations.

This hands-on workshop will provide the knowledge and experience you need to be prepared to migrate your applications from Java 8 to Java 11 successfully.

Server Side Swift Saves CodeMash: Breaking free of the phone

Anne Cahalan

CodeMash is a whirlwind of great workshops, talks, and experiences. If only you could capture these insights and save them forever...

Swift can help -- but we're NOT going to build an iOS app! Server Side Swift has gone from a fun idea to a robust, mature platform for moving data from the backend to the front. In the first half of this precompiler, we're going to build a fully functional backend in Swift, using Vapor. Then we'll leverage that backend to support a web app templated in Leaf and hosted on Heroku for you to compile notes on the CodeMash sessions you'll attend during the week. And since we know conference wifi can move at the pace of the Kalahari's lazy river, we'll use the second half of the precompiler to build a Mac app that shares authentication and network infrastructure with our web app. We'll use Server Side Swift to save CodeMash forever!

Help Cure the #1 Leading Cause of Death in America

Luther Hill

The number one leading cause of death in America is Cardiovascular Disease. Doctors often spend years researching cures for this disease without any results.

In this highly interactive 4-hour tutorial attendees will build an image recognition model and then use it to build and deploy a web app to the cloud that will help researchers from around the world find a solution to this problem.

Hands-on Infrastructure as Code

Learn the benefits of Infrastructure as Code (IaC) in this workshop where you'll provision resources in AWS using both CloudFormation and Terraform. Learn the joy of creating Infrastructure in a repeatable manner with a single command line replacing a hundred clicks in the web console.

Ensure Your Users Experience - A Trip Around User Validation Tools

Rick Clymer, Aaron Glass

In today's fast feedback world, getting our product in front of users often is incredibly important. But how do we know our product is ready to go in front of our users. Sure, we have 1,000's of unit and integration tests on each of our microservices, but what happens when we put them all together. Ensuring our expectations of how our product works when all of the pieces are together is the final piece of the puzzle to give us full confidence we are ready to release and ensure our users are having a consistent experience.

In this workshop, we will discuss the different methods we can use to give us the confidence in our product. The main focus is on the different tools available to automate our validations. We will spend time getting to know three open source tools, Selenium (and some of the solutions built to use with WebDriver like Protractor and Cucumber) , Cypress.io and TestCafe. We'll discuss best practices for each of the tools as well some ways that we can make our product more testable. We will also look at how these tools can help share knowledge of our how our product works as well as our products codebase. And while using these tools is a great way to know if we are ready to ship it off, we'll look at some things you can do in production to ensure that you know of issues your customers are having prior to them even calling you.

The hope is after this workshop, you have the knowledge of all of the tools we discuss and the confidence to pick a path forward for you to build your organization's confidence in your ability to release to production. Using one, some or all of these tools will open up a new world for areas of your product to worry about and give you more confidence that your users are having the experience they desire and you imagine them having.

What to expect when you're concepting - Product Learning Lab

Saad Kamal

You have a great idea for a digital product and have committed to making your vision a reality. What now? Product Learning Lab will walk you through the basics of how to communicate that great idea to the rest of the world - and more importantly - the rest of your eventual product team. Learn to speak the language of your pre-cut team to get that great idea out of your head, and into the world. Learn how to build persona's, define your epics and features, draw the line for your MVP and listen learn where to spend your dollars next based on what your customers actually need. You'll leave the session with the blueprints for your new product and a better understanding of what to expect as you make your idea a reality.

Creating a Cohesive Collection of Components with React

Russell Skaggs

Component libraries enable teams to do more work quicker. It frees up our designers and developers to work on big issues, while allowing them to make updates with surgical precision. Building components within React has never been easier. During this presentation we will: create a set of React components, export them into a Node Module, and consume them in different applications.

Analysis and Defense of Automotive Networks

Samuel Hollifield

Note: This precompiler will require an additional ticket purchase in order to retain the Arduino hardware featured in the presentation.

Modern vehicles are critically vulnerable. They rely on many electronic computers and sensors which communicate by broadcasting critical information over many Controller Area Networks (CANs). CANs are required by legislation on modern vehicles for emission and diagnostic purposes. Previous research has shown that a vehicle's network has dangerous implications—hackers can collect data from remote vehicles and even disrupt vehicle control. Although automotive manufacturers are evolving to protect against these intrusions, the practical application of cybersecurity in the field remains inconsistent. In this precompiler, attendees will build their own automotive interface centered around the Arduino ecosystem. We will use these do-it-yourself CAN tools to sniff traffic from a simulated automobile and identify functional signals from the network. Further, we will inject arbitrary data to affect vehicle function and understand basic diagnostic applications. By the end of the presentation, we will build an intrusion detection system which will help protect vehicles at home and in motion.

Waiver: Not responsible for DMCA violations, bricked cars, or accidents. Void where prohibited.

Building a DevSecOps Pipeline

Gene Gotimer

The release date is a week away. Development is complete. The code works, and everything looks good. Marketing is ready with the media blitz. Our customers are waiting to get their hands on the new features and are sure to give us good feedback. The only step left is to get the security group to scan the application and give us the approval to release. Cross your fingers- let's hope we get the green light! Otherwise, I don't know what we are going to do.

DevOps, and more importantly, DevSecOps, promises to do away with rolling the dice at the end and hoping we are allowed to release what we built. To get there, we need to put the right tests and checks into place, so we have confidence that we are building a secure application that is ready for release.

Join Gene as he helps you a DevSecOps pipeline using open-source and automated tools. You'll stand up a pipeline and add tools using automated scripts so that you can do it again in your organization when you get home.

Practical Microservices: Get Hands-on with Event Sourcing and CQRS

Ethan Garofolo

Have you attempted a microservices architecture and struggled? Have you read about event sourcing and CQRS, but are disappointed to only find high-level descriptions? Want to get hands-on and actually learn these concepts in the context of a functioning system? This workshop does just that.

This workshop covers:

- The difference between applications and services and how to avoid the dreaded distributed monolith (spoiler: it isn't about docker or Go---it's a data model)
- Modeling system state as events and organizing those events around the streams that store them
- Reshaping those events into view data and showing it to users

Come learn the basics of microservices, an architectural pattern that keeps your team productive.

Micro Frontends: Breaking up the Frontend Monolith

Kito Mann

Over the past several years we have embraced microservices as a way to “break up the monolith” and reduce complexity, allowing teams to focus on specific areas of functionality, while providing more flexible scaling and better fault isolation. However, for most of us, the front-end has remained largely un-touched — it is, in essence, still a monolith. What if the same team was responsible for the UI and the service, and you could compose a web app out of different micro frontends — each providing a core set of functionality but all playing well with each other? This tutorial explains how that process can work, using Web Components as the bridge between different JavaScript frameworks on the front end, and Eclipse MicroProfile for the Java microservice on the back-end.

Coaching Katas - In Search of The Answer to the Agile Kobayashi Maru

Charles Husemann, Faye Thompson

These virtues are formed in man by his doing the actions. -- Aristotle

A code kata is an exercise in which developers hone their programming skills through practice and repetition. This workshop is intended to do the same thing for agilists by providing them with difficult real-world scenarios to discuss, and a safe, supportive space in which to practice effective coaching techniques.

Working in small groups, we will role-play simulated work situations while practicing some common coaching techniques. The goal is to give new and experienced agilists the opportunity to learn from each other in how they deal with difficult scenarios.

General Session 01 - Thursday 8:00

Quantity vs. Quality: Is less (code) really more?

Anne Cahalan

We all strive to write clean, concise, reusable code. Everyone's had a moment of looking at a 500-line file or a 50-line method and thinking, "This is just too much code!" There can be real joy in breaking a giant mess into small, tidy bits. But when does the quest for brevity lead us into a swamp of complication? Is there such thing as too LITTLE code? Can a method that does too little be just as dangerous as one that does too much? When we treat deleting lines of code as a good thing in and of itself, we run the risk of creating code that's harder to understand. Let's find the balance between extreme loquacity and excessive concision and then navigate the sensible middle path between less and more.

Technical debt must die - Communicating code to business stakeholders

Matt Eland

Our software sucks. We're up to our necks in bugs and technical debt, yet we often seem to hit roadblocks explaining things in ways that bring about meaningful change. In this session you'll learn to gather, analyze, and interpret data in order to create effective presentations to communicate quality, technical debt, and other technical matters in ways that tell a compelling story. You'll master how to communicate effectively with key stakeholders by taking a data-driven approach blended with storytelling techniques to bridge common gaps between development and business stakeholders. You'll explore the 7 tools of software quality and how they can bring clarity and sanity to the decision-making process, justify paying down technical debt, and focusing on improving our software in the areas that need it most.

Building Mobile Applications with the Ionic Framework

Robert Lair

Have you wanted to start developing mobile applications, but have found that selecting the right technology, framework, and language is overwhelming? Ionic provides a framework that allows developers to build

applications using familiar web technologies in order to produce a native application experience for iOS, Android and Windows Phone. Unlike other frameworks that can be extremely expensive, Ionic is completely free and backed by a vibrant community of millions of developers who have used Ionic to build more than 5 million apps. This talk will provide a brief introduction to Ionic and will look at how to get started developing, testing and deploying your apps. We will also look at how to take advantage of native phone services using Ionic.

The UX of Configuration Files

Eemeli Aro

Developers are people too, and should be your primary concern when designing an interface for them to configure your tools and libraries. In other words, there are better options than JSON available, but they each come with associated costs and limitations. How well do JSON5, YAML and TOML play with each other, and what else is out there? How do the tools associated with these languages compare, and when is writing your own the right choice? And do you even really need config files?

How I overcame my fear of JavaScript

Kim DelSenno

As a front- end developer, my current job has me using HTML, CSS, and a little bit of JavaScript. In this talk, I am going to walk you through exactly how I got over a major career slump and overcame my fear of going deeper into the world of JavaScript. I will walk you through how I learned to use Gatsby, a React static site generator, to update a personal website. It doesn't matter how you get started - just get started, and keep going.

Full Total World Global Domination: Creating a Geographically Redundant Website.

Ryan Miller

Who doesn't want to dominate the world with a geo-redundant website that is actively served from multiple regions simultaneously and can seamlessly fail over when problems occur? Haven't we been hearing about this for years? The cloud is everywhere now. It's just button clicks, 5 minutes, easy right? Sure, everything's easy until you bring data consistency into the picture.

In this session, attendees will witness the journey of a real world data-centric web application as it is modernized to take advantage of cloud capabilities and become a true geo-distributed application. We'll talk through the driving factors and limitations, and then dig into major decision points around application and cloud service architecture, data consistency, data storage, caching patterns, logging, auditing, connection string management, and any other little-talked about gotchas we can pack into the session.

Threat Modeling on the Family Road Trip and Other Strategies for Delivering Secure Applications

Angela Pinney

Gene Spafford said: "The only truly secure system is one that is powered off..."

Everyone wants secure applications, but creating them is hard, and we don't all have security certifications. How do you know where to start when "security" is not your full-time job? And how do you get the rest of your team on board?

Take a journey and learn about the progression of adopting a security mindset with a real-world example, played out on the family road trip.

Join Angela Pinney, software architect, to discuss the challenges with adopting a security mindset on a product team, what steps we can take to empower our team members to own security of their own applications, and how we can leverage shift-left and modern CI principles to sustain it.

Leave this session prepared to champion security on your own team and to grow a security mindset in others.

What Architecture (The Building Kind) Can Teach Us About Architecture (The Software Kind)

Wes Delp

Architecture has existed for the better part of human history. Over 2000 years ago, the Roman architect Vitruvius claimed that a good building must be durable, functional, and bring delight. Sounds familiar, right? This session will explore how architectural design concepts such as 'less is more', 'form vs. function', and 'adaptive reuse' can be applied to the software patterns and structure in your own applications. You'll discover how the successes (and plenty of failures!) in building design over the years provide timeless lessons for designing and architecting software that will stand the test of time.

Open Source XAML Takes You Places!

Sam Basu

XAML started life as a simple thin UI markup layer, but has had a surprisingly eventful history over years – from phenomenal rise to teetering on life support. Today, XAML powers a lot of app platforms and seems poised for success going forward. And almost all of XAML application stacks are now open source!

Want pure Windows desktop apps – WPF XAML got you covered. Want apps for every Windows device – tablets, Surface Hubs or HoloLens? UWP XAML provides a rich ecosystem. Want to stretch UWP XAML over to iOS/Android or WebAssembly? Uno Platform has you covered. And Xamarin.Forms XAML allows developers to target various mobile platforms from single code base. But Xamarin.Forms' reach goes beyond just mobile platforms of iOS, Android & Windows – did you know your Xamarin.Forms XAML could target MacOS, Tizen, Smart Watches, Smart TVs, Refrigerators & HoloLens? And it's not just futuristic devices or platforms, you could take Xamarin.Forms goodness back to WPF & even Web! Yes, we're talking XAML being back in the browser – just done right this time.

Let's unpack the magic behind democratization of X-platform .NET development. Today's open source XAML is flexible & powers a lot of app platforms.

Making Faces: Image Reduction and Recognition

Steve Crow

A 350px by 300px image contains 105,000 individual pixels. Comparing each pixel to tell whether or not two images are the same is not efficient. What if we could reduce the number of features, while still maintaining patterns and trends? What if we could perform this recognition by only comparing 25 data points?

Principal Component Analysis is a standard method of extracting features from such a set of data.

This talk will show how Principal Component Analysis and the Singular Value Decomposition can be used to extract features from images of faces. With the ultimate goal to recognize the same face across different expressions and images.

TDD Designer Style: Styleguide Driven Development

Matthew LaForest

Developers have adopted a number of techniques to help speed development of their products. Leveraging tests to help them design the interfaces to their underlying pieces (classes, functions, components, etc.). For a long time the interface between designers and developers has been a continual rough point. Traditional TDD doesn't work well in that environment, as the UI pieces need to be intentionally flexible and looking at the change of a string value tells you little about how it will actually look.

Enter Styleguide Driven Design, using the Styleguide as your test bed for developing new UI components can help the entire development team.

- It provides an easy place for developers to go when trying to add a new piece of functionality
- It provides a test bed for designers to see how a change will ripple across the application
- New tools allow us to easily detect all of the places that will be updated by a design change

Learn how to use Styleguide Driven Design to up your game.

End to End Testing with Cypress

Avindra Fernando

Lots of companies are investing in end to end testing to release high quality software and remain competitive in today's market. But, end to end testing also come with a set of challenges that we have to overcome. Setting up, writing, running, and debugging these tests could be challenging and tedious. Now with Cypress, end to end testing has become very intuitive and a whole lot of fun.

Cypress is a blazing fast testing library that integrates well with your favorite front end frameworks like React, Vue, or Angular. With Cypress, you do not need to install various other tools and libraries to write and run your end to end tests. Since Cypress tests are so easy to work with, developers as well as QA engineers will enjoy it a lot.

In this session, we will explore Cypress and look at how you can integrate it with your web application. This end to end testing experience will enable you to release high quality software to your clients.

Python, the world beyond scripting

Charles Yost

Python is a wonderful language for writing simple scripts. But have you ever wondered how to go to the next level? What does it take to create a library, a desktop application, or a web application in Python? How does documentation, testing, packaging, and deployment work? What are all these crazy in-jokes about a British Comedy Troupe? And why is there so much angst about upgrading from a major version to the next? This talk will cover all of that and more to get you started on the right foot for developing more than just a script or two in Python.

General Session 02 - Thursday 9:15

Usability Starts With Accessibility

Patrick McSweeney

For many web developers, accessibility is an afterthought, if they even think about it at all. What they fail to realize is that planning for accessibility from the beginning can actually enhance the design process rather than hindering it, with the end result being more usable by everyone. This presentation will cover some common web accessibility techniques and show you how they can change the way you think about web design.

Intro to Machine Learning on the cheap and without a PhD in math: Overview

Jim Wilson

Machine learning has traditionally required a command of advanced mathematics, years of university training, and expensive hardware to implement. Now with better open source tools and online resources it's easier than ever to create your own robust neural networks. Be it image recognition, natural language processing, or sophisticated data categorization, it's possible to learn the fundamentals of machine learning and experiment with different architectures to create your own individually optimized solutions.

This talk will cover the basics of neural nets and how to use Google Colab notebooks, Python, and the fastai/PyTorch libraries to develop your own customized neural networks...all for free.

Angular and The Case for RxJS

Sandi Barr

When choosing Angular to build a front end app, it can seem like RxJS is just one more thing to learn, and there's no easy transition coming from another framework. But RxJS is efficient and expressive! We declare relationships between entities, describing the what not the how. The basic sequence operators, map, filter, and reduce, are probably familiar from using them in array chains. RxJS is a core part of the Angular framework used in everything from Reactive Forms to the HTTP module. Harnessing observables with Angular's async pipe is essential to building clean and concise components. Developers can overcome the RxJS learning curve by focussing on core concepts like hot vs cold observables, piping operations, and a few of the most common operators.

Document Yourself: A framework for career advancement

Michelle Brenner

The goal of this workshop is to document yourself the way you would document code. You wouldn't expect someone who wants to use the program you built to read every line of code. Instead, they're relying on the design documents and doc strings to know how it works. The same is true with your career. This workshop is about making it easy for you to provide overwhelming evidence of your value to the company. When you can show your ROI, it's much easier to secure that promotion, raise or new job that you deserve.

This workshop consists of 3 parts. Writing your daily accomplishments in the form of success statements. Putting them together into a brag sheet. And finally using them to create your elevator pitch. Using this framework makes it easy to make a habit of documenting, the same way a style guide helps you document your code. Once you have documented yourself, you will be amazed at how much you have accomplished. You will walk out of the workshop with the confidence and plan to take your next step.

Beware of dark clouds on the horizon

Andrew May

There are many benefits to be gained in moving your infrastructure to the cloud, but many more ways in which it can go horribly wrong. Will yours be the next company to expose confidential information in a public S3 bucket? Will your cloud account become unmanageable and expensive because all the developers have been given carte blanche to create whatever they want? Learn some best practices for managing accounts, costs, resources and security in cloud environments, and hopefully avoid your company from becoming the next cautionary tale.

Project Zero or Removing barriers for creating OSS libraries

Jimmy Byrd

You have a brilliant idea for an open source library. You start this new repository thinking of how bright the future is with your code being use by others. Then reality then sets in. You realize to make all this possible you have to do a lot of non-feature work. You need a project structure, a test framework, a build system, dependency management, continuous integration, deployment, and other tooling. All this is getting in the way of writing a great library you know will change the world! What if I said you can do all this and more? This talk will cover MiniScaffold, a dotnet template for getting your project up and running with little effort so you can create the libraries of your dreams.

Going crazy with CQRS

Seth Kraut

CQRS stands for Command Query Responsibility Segregation, which doesn't clarify that much. CQRS is a high performance, event oriented flavor of Domain Driven Design. CQRS challenges our normal conception of design. By separating read and write logic, this architecture unlocks unique possibilities.

A .NET Data Access Layer You're Proud of (Without Entity Framework)

Jonathan "J." Tower

If you're a .NET developer, it almost goes without saying that you use Entity Framework as part of the data access code on your software projects. Sometimes, EF is just right for the job, but other times you want something more simple, with better control of the generated SQL queries, and more performant. Over the years, several micro-ORMs (object relationship mappers) have evolved for just this purpose, because often, the simplest solution is the best one.

Come along on this walk-through of some popular alternatives to EF, an overview of .NET micro-ORMs, and useful design patterns that you can use to organize them all into a powerful, fast, and coherent data access later. Leave this sessions armed to make a simple, high-performance, and easy to use data access layer that you can be proud of.

Kotlin for C# Developers

Alex Dunn

Dive into the latest craze in languages and platforms - Kotlin. This time we will be looking at it from the perspective of a .NET C# developer, draw comparisons between the languages, and bridge the gap between these 2 amazing languages.

We'll look at: - Kotlin as a language - Platforms Kotlin is great for - Object Oriented Implementations in Kotlin - Extended Features - Features Kotlin has that C# doesn't - A demo Android application in Kotlin vs a Xamarin.Android app in C#

In the end you will leave with a foundational knowledge of Kotlin and its capabilities to build awesome apps with less code. You should feel comfortable comparing C# applications to Kotlin applications and know where to find resources to learn even more!

Super Sleuth Testers: Unlocking the Power of Browser Developer Tools

Hilary Weaver-Robb

There's a tool to aid our testing that we all have access to all the time. It's hidden in plain sight, you just have to know the secret code to get to it. This secret tool? The browser's developer tools, of course! Learn how the developer tools in your browser can give you insight into what your application is really doing, access to artifacts vital to testing (like cookies and cache), and learn to speak to your application directly, like never before. Unlock a whole host of information about your application, and release your inner super sleuth tester!

Support Emoji 🙋 and Go Worldwide 🌐 with Unicode

Joe Sewell

As the world becomes more and more connected, the way people communicate becomes more and more important. A prominent example is emoji: those little icons that are popular in text messages 📱 and on social media 📱. Proposals for new emoji will often make the news. But did you know that emoji are just a small part of the larger Unicode Standard, aimed at unifying all forms of written language into one system? By supporting Unicode in your apps, your users can use the latest emoji 🆕 and also communicate in over 80 written languages. This talk will demystify Unicode. It will include an overview of the key concepts and problems in text encoding, the history of Unicode and emoji, a comparison of the different ways you can encode Unicode characters (e.g., UTF-8), and examples of using Unicode in a variety of programming languages and platforms. Afterward, you'll be ready to take your apps all around the globe 🌐🌐🌐 with a smile 😊.

Going Loonie: Rebuilding the tape deck experience with Elixir, Nerves and RFID

Ole Michaelis

My wife and I built an Open Source, RFID based, WIFI enabled cassette-style recorder, powered by Elixir and the Nerves Framework. We call it the Looniebox, and it's a wonderful way to share the old "fumble with scissors in the cassette to fix it" experience with our kids. In this talk, we'll discuss the work that went into creating the Looniebox, the journey learning hardware hacking and the Nerves Framework, and the love and joy we put into building it. And why a Looniebox cluster does make sense! If the kids let me take it away from them, the Looniebox will also be demoed.

Capture That Flag : How CTF Competitions Make You a Better Developer

John Koerner

Have you ever been asked to "think like a hacker?" Do your eyes glaze over when you have to sit through a security audit of your application? Do you want to avoid having an incident like Target, Capital One, or Equifax? If any of these apply to you, consider participating in a Capture the Flag (CTF) competition. Together we'll explore the basic concepts of a CTF, a bevy of tools that are available to you, and dig into some example flags that have relevance to you as a developer. We'll cover topics such as buffer overflows, SQL injection, and cross site scripting, just to name a few.

You'll walk away with the skills needed to participate in your first (or your next) CTF competition and with the knowledge of how this will make your applications more secure. Maybe you'll even be inspired to join the CTF here at Codemash

Taking a byte of Java Bytecode

Magnus Stahre

Java, Scala, Groovy, Kotlin, JRuby, Jython, Clojure. What do all these languages have in common? They are all powered by Java Bytecode. With the current ecosystem of languages running on the JVM, it is becoming important to learn more about the least common denominator. This talk gives an introduction to Java Bytecode, with practical examples and an implementation of a very simple JVM based language.

General Session 03 - Thursday 10:30

[CANCELLED] Adding Search Capabilities to your Applications with Elastic Search

Rod Paddock

This session has been cancelled. We apologize for any trouble this causes.

The Integration Game: How to Pick a Winning Integration Pattern

Branden Bellanca

Point-to-Point, Hub-and-Spoke, ESB, Remote Process Invocation, batching... so many terms fly around when talking about enterprise integration. How can we best decide which of these is the "right tool for the job"? How can we develop an integration architecture that supports the business's needs, while still maintaining a scalable architecture? In this session, we'll dive head first into some common integration patterns, their strengths and pitfalls, and strategies to help you decide what best meets the needs of your organization.

Building a Custom CSS Framework Was Easier Than I Thought

Nate Taylor

If you're like me, you've used several different front end frameworks such as Bootstrap, SemanticUI and others. You've enjoyed that they give you consistent components and layout.

But perhaps you've been frustrated by those same tools. It could be that every site you have created with them looks the same. Or maybe you've gotten into fights with your design team as they ask for a look and feel that is nearly impossible for you to pull off.

That was me until recently. Combining React, design systems and Storybook, my team and I were able to create our own component library from scratch, and it was easier than I could have imagined.

But more than just having our own framework, we found that our team was much more collaborative involving developers and designers as we created a custom UI for our client.

This talk walks through our experience, lessons learned, and highlights some tools and libraries that were essential in creating our own UI framework.

Make More 💰 Money with Less ✂ Effort: 🖋 Experimentation Before Implementation

Scott Showalter

Developing apps is time consuming, with little guarantee of success. The Web, App Store, Google Play and beyond are littered with apps making low or no revenue because they don't solve problems people actually care about. Before you build your "killer" ap, how can you truly know beyond the shadow of a doubt that there's actual demand for it? In this session, learn how to discern whether people will actually buy, use and love your product before you put in all that effort! This amusing, fast-paced workshop teaches several product prototyping and experimentation techniques that you can use right away to prove whether your product or feature ideas have worth, or to help you transform non-valuable ideas to valuable ones.

Whether you work solo or on a team, no matter what kind of product you work on, this workshop will engage you in activities you can take with you back to work and immediately employ to significantly increase the odds of a bigger pay day by building only the parts people would actually use and find value in.

Practical Cryptography for Developers

Anthony Eden

Understanding the building blocks for cryptography is important for every software developer, especially as the quantity and value of data stored and sent over networks continues to grow. In this talk I will introduce you to the fundamentals of cryptography, demonstrating concepts such as symmetric and asymmetric encryption, hashing functions, message authentication codes, and more, using code examples. By the end of this talk, you

will have a basic understanding of the different components used to ensure primary functions of cryptography, as well as a set of resources for further exploration into modern cryptography.

+5, Insightful: Azure Application Insights to improve your code

Tim Jarzombek

You've worked hard on your app and are excited to finally release it. However, you start seeing reports of slowness, and it seems to crash once every 7 hours. Learn how to use Azure Application Insights to identify application issues like slow performance and crashes down to the line of code running on server-side or client-side.

Cosmic Full-Stack a Blazor, ML.NET, and CosmosDB Mashup

Ed Charbeneau

Are you ready to count down to liftoff? In this session, we test the limits of the .NET stack in an incredible mission to build BlazePort, a futuristic ride share app for space travel. We'll use a mashup of the latest in .NET technologies: leveraging CosmosDB for data persistence, model travel prices with ML.NET (via an Azure Function), and go full-stack with ASP.NET Core and Blazor for an end-to-end C# development experience. Strap yourself in for fast paced demos and hot bits on this journey through the .NET ecosystem.

Vue 3.0 Smaller, Faster & Stronger

Dan Vega

Vue.JS has quickly become one of the most popular JavaScript frameworks around. The Vue Core Team is getting ready to release the third major version of the framework and it's packed with new features and performance updates. In this presentation, I will show off some of those new features such as:

- Composition API
- TypeScript Support
- Proxy-based change detection
- Fragments
- Portals
- Suspense
- Performance Improvements (Smaller & Faster)
- & Much more

Vue 3 is a major rewrite of the framework and it will be its biggest release to date. Join me as we explore the exciting changes to an already amazing framework.

Antifragile Teams

Charlie Sweet

Software development is an activity that's fraught with complexity, ambiguity, and therefore risk. Many organizations attempt to mitigate that risk through stringent processes, but there is a better way.

In nature, there are three types of systems.

1. Fragile systems that break under stress, like a teacup.
2. Resilient systems that resist stress, like a rock.
3. Antifragile systems that become stronger when they are stressed, like your muscles when you exercise.

Most organizations attempt to build resilience, but do so in a way that nearly guarantees fragility. Designing for "antifragility" is a much better goal.

In this talk, you will learn about the concepts of antifragility, the concepts of teams (as opposed to working groups) and how we can apply antifragile concepts to make our teams less fragile:

- Why mass standardization and strict process control does not result in robustness.
- Long-lived teams may be a major cause of fragility.
- The proper role of an agile coach.
- Different teams in the same organization should look, act, and operate differently.
- The best way to stay stable and predictable is to embrace volatility and chaos.
- The unintended side-effects of intervening to fix the mistakes of a team.
- How to strengthen your team.

Intro to Hacking with the Raspberry Pi

Sarah Withee

You've heard lots of hype about the Raspberry Pi, the credit-card sized computer available for under \$40. This (updated) talk will introduce some of the Pi's features, explore some sample projects you can create, and show you how to write code to control hardware through it's IO pins. After this talk you will be ready to make your own cool hacking projects with the Pi.

What can Structured Logging do for you?

Charles Yost

Structured logging is a way to bring order and value to your logging. Gone are the days where print debugging was the only option. Now as logs become more complex, developers struggle to pack more information into a single line. The modern solution has emerged: Structured Logging. But this is not just another buzz word to be checked off a list. There is real value in using structured logging in your next project, or even in starting it use it in an existing codebase. Let me show you what structured logging can do for you.

API Design - The Right Way

Jit Krishnamurthy

APIs are at the core of how applications interact with each other. The first step in developing an API is to design it and ever since Eric Evans introduced Domain Driven Design (DDD) in his book 'Domain Driven Design: Tackling Complexity in the Heart of Software', it has been the go-to tool for architects, design authorities and developers alike.

In this talk you will be introduced to Domain Driven Design concepts like domain, model, ubiquitous language, entity, bounded context and other key elements. We will take an example and break the complex system down into aggregates that will eventually be developed into APIs.

General Session 04 - Thursday 11:45

Bringing Order to Chaos

Scott Connerly

So, you find yourself coding in a code base that has some warts. OK, let's be honest, its a steaming pile of gum and toothpicks you're afraid to touch lest it might fall apart. How do you get from there to ... anywhere, let alone viable, architecturally useful, and stable? In this talk, we'll explore strategies I've used in the past and we'll have a bit of a group therapy session along the way.

Let's talk about documentation (but more fun than that sounds)

Mike Hand

Street signs. Clothing tags. LEGO instructions. Furniture assembly... "instructions." Every field requires documentation, but some are far better at it than others. We'll take a tour through the highlights and lowlights, hits and misses -- and then see what we can apply back to the field of software development.

Conducting Humane Code Reviews

Adrienne Tacke

Code reviews are a must in a proper development workflow, but what happens when performing or receiving one becomes as fun as getting a root canal? Instead of contributing meaningful suggestions, developers often use these reviews as an opportunity to rehash old arguments or show their "superiority".

This talk will describe the common mistakes developers make while performing a code review, the unwanted side effects they can cause among a team and their codebase, and worthwhile strategies to implement so that these issues are less likely to occur.

By the end of this talk, dev teams should be able to conduct code reviews fairly, catch substantiated mistakes, make productive suggestions, and still like each other afterward!

Hobby Projects Are Awesome!

Joel Byler

There you are, enjoying a hobby that you love. One that gets you away from your screens and keyboard. Then out of nowhere an idea comes to mind, maybe its spurred by a problem that you encountered or a way that you could improve on a technique, you pull from your experiences and decide to start a new project that helps to scratch that itch. Of course, since we're all tech professionals, we find ourselves building these solutions with the technologies we know, or wish to learn more about. This is all fantastic, but how do we get started? What do you do when you're not sure your users will like it? How do you do this on your own? And even more importantly, how do you avoid burn out, I mean this is a project to help with a hobby that gets you away from your keyboard and now you're right back at the keyboard instead of doing that hobby you love so much. This talk is also intended to help folks who have had these ideas but get stuck, if those old ideas still inspire you then lets pick them back up off the shelf and finally finish them, and get them out there for the world to enjoy!

Automating Your Automation: The Care and Feeding of Jenkins

Jeff McKenzie

If you're like 70% of continuous integration and delivery users out there, you're using Jenkins, the powerful and popular automation server. But how do you know you're doing it right? Are you getting the most out of the strategies you've chosen? In this session you'll learn how best to manage your automation, how different job types and plugins can improve your architecture and decrease your maintenance effort. Almost no matter where you are in your automation maturity, there's always another level to reach: if you're using the basic point-and-click of freestyle jobs, you can move to the scripted context of pipelines. Once you've explored pipelines, you can learn to leverage shared global libraries to promote code reuse across multiple pipelines. In this session, you'll learn basics about Jenkins, specific use cases for different job types, and how best to manage your automation as it grows from one job, to ten, to one hundred. Finally, you'll learn how to create your entire Jenkins job collection from scratch, at the push of a button.

Why You Fail to Make Good Predictions and What You Can Do About it.

What sets good predictors apart from others? Is good judgment innate or something you can nurture?

As a knowledge worker, your ability to make good decisions will set you apart from your peers. Whether you're planning out a work project or playing fantasy football good predictions are essential to success.

In this talk, you'll learn what gets in the way of making good decisions and predictions. You'll also walk away with tips on how to improve your chances of succeeding and how you can 10X your positive outcomes in the midst of risk and uncertainty.

Modular Monolith: the Best of Both Worlds

Seth Kraut

First, everyone wrote monoliths, but monoliths invariably become a big ball of mud. Now, microservices are all the rage, but they come with significant complexity. Modular monoliths combine the simple development and deployment of monoliths with much of the decoupling of microservices. This session will show you how to tame your system with modular monoliths.

Graphing Your Way Through the Cosmos: Common Data Problems Solved with Graphs

Chad Green

Data as it appears in the real world is naturally connected, but traditional data modeling focuses on entities which can cause for complicated joins of these naturally connected data. That is where graph databases come in as they store data more like what happens naturally in the real world. Sure, there a lot of talk about using graph databases for social networks, recommendation engines, and Internet of Things; but using graph databases can also make a lot of sense when working with common business data problems.

In this presentation, you will get a better understanding of what graph databases are, how to use the Gremlin API within Azure Cosmos DB to traverse such data structures, and see practical examples to common data problems.

Help! My Client Needs a VPAT and other Accessibility Questions

Courtney Heitman

What is a VPAT? Why do my clients keep asking about them? These questions are becoming more and more common with the rise of accessibility lawsuits. VPATs (Voluntary Product Accessibility Template) are the common ask for companies to make sure they are buying software that is accessible.

This talk will go over what a VPAT is, how to start auditing your websites for accessibility, and the basics of how to write a VPAT. You'll leave this session with a greater knowledge of accessibility, and the current legal landscape, as well as how to go back to your company and answer some of your clients questions about accessibility.

An Introduction to WebAssembly

Guy Royse

Want to write a web application? Better get familiar with JavaScript JavaScript has long been the king of front-end. While there have been various attempts to dethrone it, they have typically involved treating JavaScript as an assembly-language analog that you transpile your code to. This has lead to complex build pipelines that result in JavaScript which the browser has to parse and *you* still have to debug. But what if there were an

actual byte-code language you could compile your non-JavaScript code to instead? That is what WebAssembly is.

I'm going to explain how WebAssembly works and how to use it in this talk. I'll cover what it is, how it fits into your application, and how to build and use your own WebAssembly modules. And, I'll demo how to build and use those modules with both Rust and the WebAssembly Text Format. That's right, I'll be live coding in an assembly language. I'll also go over some online resources for other languages and tools that make use of WebAssembly.

When we're done, you'll have the footing you need to start building applications featuring WebAssembly. So grab a non-JavaScript language, a modern browser, and let's and get started!

A Mobile App Success Starter Pack

Jeff Kelley

When you're pitching a mobile app to a prospective client, it's easy to focus on the app's raison d'être. A pizza-ordering app should order pizza, a messaging app should send messages, and a game should be fun. For an app to succeed, there are countless other hidden tasks to consider: does your app respond well to poor network connectivity? Is it always clear when it's waiting on network communication? What happens when you ship the app but need to prevent users from using a broken version? In this talk we'll look at common examples of the unspoken assumptions made when creating apps—assumptions that clients may have, assumptions users definitely have, and the things no app should leave an App Store without. Using these critical features as a guide, you'll be better prepared to estimate project length and deliver amazing (and successful) apps.

Securing Your API Endpoints - A Practical Authentication Guide

Seth Petry-Johnson

It's never been easier to expose services over HTTP. It's also never been easier to inadvertently expose security holes via those same services.

This session is designed for the average developer/architect that wants a brief overview of API security without getting into the weeds of cryptography or complex authentication frameworks. You'll learn about OAuth, API Keys, HMAC, JSON Web Tokens (JWT) and more. Don't worry if those things sound foreign; they'll be explained in a clear, practical way so that you'll be able to choose the appropriate tool for your specific needs.

Tests Your Pipeline Might Be Missing

Gene Gotimer

Developing a delivery pipeline means more than just adding automated deploys to the development cycle. It's about gaining confidence that your builds are viable candidates for release or production. For development to be successful, tests of all types must be incorporated throughout the process to be sure that problems aren't slipping through. Most pipelines include unit tests, functional tests, and acceptance tests, but those aren't always enough. I'll present some types of testing you might not have considered, or at least might not have considered the importance of. Some tests will address code quality, others code security, and some address the health and security of the pipeline itself.

This talk is aimed at people that are trying to build confidence in their software delivery pipeline, whether it is automated or not. Gene will talk about specific tools he uses to supplement his pipeline testing. He won't get into how to use each tool-- this is more of a series of teasers to encourage people to look into the tools, and even letting them know what types of tools and testing opportunities are out there.

Impress Your Boss with Interactive Visualizations

Tim Garvin

We all have little troves of data lying around, begging to be analyzed. In this session, we'll talk about how to visualize your data to tell the story you want. Whether you're trying to decide what support ticket to work on next, convincing your team it's safe to let you rewrite a module, or just bucking for a raise; a slick viz can help you make your point. We'll talk about some simple rules of thumb to follow, pitfalls to avoid, and look at several popular libraries and platforms for data visualization. Includes Python Notebooks, d3.js, and straight React SVG. Sorry, no pie charts allowed.

General Session 05 - Thursday 1:00

Hacking Radiowaves for fun (but not profit)

Craig Hills

As a child, did you ever play with walkie talkies? Do you remember how fun it was to talk with friends and family from the other end of the house, or across the neighborhood? Capture that feeling again, except this time learn some science behind it and how to use the same technology to contact someone on the other side of the country with just a radio and some wire. This session is an introduction to amateur radio aimed toward IT professionals. Accordingly, the focus will be on how to get licensed, and introducing the more technology focused aspects such as digital communication modes, antenna design, and commonly used software. While amateur radio cannot be used for commerce, many lessons learned in the hobby are almost directly applicable to everyday work and you will walk away with a better understanding of wireless technology.

Postman Delivers! A Deep Dive into API Testing.

Bob Crowley

Whether you are a tester or a developer of HTTP API's, chances are you are already using Postman to some degree. Chances are also that you are missing out on some of the advanced goodness. Using only features of the free version, this session introduces you to effective use of these features to save time, reduce errors and share your work.

You learn how to :

- unclutter your collections with environments
- create dynamic requests with the powerful scripting environment
- chain requests (never run a separate utility to generate auth tokens again!)
- data drive an entire suite of tests with just a few clicks.
- backup and share your work
- automate the whole shebang from the command line, optionally with reports
- much more...

Ditch the click/wait/verify/repeat cycle! Concepts presented here apply to API testing in general, whether you use another tool or test with code only. Save time and gain confidence in your software.

How to Get Started with Swift in 2020

Leo Dion

Swift is now a half decade old since its introduction at WWDC 2014. With Swift 5 and ABI stability, Swift has matured into a language ready for new adopters. In this talk, Leo gives an introduction to Swift development as well as Swift's journey from the iPhone to the Watch to servers. Leo also covers: - How has Swift changed in those years? - What is the future of Swift? - What does ABI stability mean for Swift? - Where is Swift headed? Come to this talk to learn more about this language.

Going Fast: The Art of Delivering Quality Software Quickly

Josh Carroll

Building software is tricky business and the demands are higher than ever. Agile was meant to free us from the confines of red-tape driven software, but most of us can't help but feel something is off in our software process.

Do you wonder why startups can launch an entire product in a few months, but it took your team 6 months to get that new feature into production?

Do you get tired of having hour long meetings with 16 people just to talk about having another meeting to talk about the color of a button to use?

Are you stuck building a bunch of features "just in case" instead of getting something working in front of a user?

Does it take you more time to plan, document and release a simple change than it does to actually make the change?

If any of these resonate with you, then come learn about a simple question you, your team, and your company can ask yourselves that will help you cut through the bloat in your software process, and start delivering value like never before.

API Gateways and Microservices: 2 peas in a pod

Santosh Hari

Chances are you've already gone through the tedious process of decomposing your monolith into microservices, or at the very least, want to use microservices in the near future. Nowadays, microservices connect to various APIs. These APIs could differ in protocols (REST/SOAP), where they're hosted (on-prem/cloud), security (tokens/JWTs) and so on. Learn how to leverage API Gateways so your microservices are able to fully connect and harness the power of these APIs. This talk will go into details on various API Gateway offerings and a decision matrix on which one to pick. The talk will also highlight the various features of API Gateways like productizing APIs, creating users and subscriptions, security, error handling, rate limiting. We will use Azure API Management to display the awesome power of API Gateways but the principles will be universal.

Hold Up, Wait a Minute, Let Me Put Some Async In It

Matthew Jones

The introduction of `async/await` to C# has irrevocably changed how .NET developers created their applications. But what about older applications? How can they get the async goodness?

In this code-heavy session, we'll take a "older" .NET web app which has no asynchronous code and slowly refactor it into a modern async app. Along the way, there'll be discussions what practices we need to be aware of, such as "async all the way down". This session also demonstrates when `async/await` is NOT needed, as well as when it is.

`Async/await` is wonderful, but it's not a cure-all. Let's take an old app, put some async in it, and see how it all comes together.

The Agile Designer: Aligning Dual-track UX and Development to Balance the Tactical and Strategic, Mi

Jenna Chamra

Product teams everywhere are embracing Agile. It's no wonder why: Agile creates better transparency, alignment and speed to market. The problem is, Agile was originally created for software developers. Design teams which try to adopt Agile often find themselves falling into "Faux-gile" or "Wagile" (Waterfall in Agile clothing) practices as they balance strategic and tactical necessities, from wireframes to critical user discovery and validation.

This session will help design and UX teams: 1. Balance UX strategy, research, tactics and validation activities in an Agile framework without sacrificing quality or budgets 2. Avoid design debt that delays projects and risks expensive re-work by finding the happy medium between working too far ahead or behind development sprints 3. Choose the right tools and metrics to create the transparency your clients, collaborators and leadership crave to ensure your product is on track 4. Understand the importance of iteration and continued refinement

By Our Powers Combined: Observability for Developers

Aaron Aldrich

The world of maintaining applications is shifting. Our Systems Administrators aren't monitoring our application servers, it's the SREs determining SLIs and SLOs for our Micro-Services and making sure our Cloud-Distributed systems are Observable in near-real time. It's enough for buzzword burnout. Furthermore, the DevOps movement asking developers to work closer with our operations teams and handle on-call shifts! Does that mean you have to learn everything about DevOps and SRE just to keep doing what you truly love, building things out of code?

Not entirely, but just as SysOps folk have started to learn valuable lessons about codifying their work, so too can developers learn how to own software in production from those that have been doing it every day.

Without diving through the whole world of Software Reliability Engineering and systems monitoring, this talk will level set and give a crash course on Observability. Let's cross-class some Ops with our Dev and build reliable, maintainable software together!

Attendees will walk away with an understanding of:

- A level-set understanding of Observability so they can collaborate with their colleagues meaningfully.
 - How cross-collaboration and a shared language provide for better quality software development
 - A handful of ideas to keep in mind during development, to make operating software easier
 - Why Developers should be On-Call, too, and the value that provides for both the Ops teams AND for building better software.
-

HOW TO HACK AN ELECTION

Gary Short

Think your democracy is safe? Better think again. In this session I'll demonstrate the techniques that the 'black hat data scientists' use to get the result they want from any election or referenda. In this entertaining talk, I'll demonstrate techniques, both at the macro level - how to attack an election systemically - and at the micro level - how I can manipulate individuals to do exactly as I want them to do.

What's in Your Docker? Open Source Security Vulnerabilities in Containers

Matt Williams

So you stay on top of operating system vulnerabilities and patch regularly, but did you ever consider that there may be vulnerabilities in your containers? In March of 2015, a report that over 30% of the "official" images in the Docker Hub contained high priority security vulnerabilities was issued by Banyan, an IT operations company.

However, not all vulnerabilities are created equal - this talk investigates methods of detecting and mitigating vulnerabilities in containers.

Unclogging Your Code: Linting 101

Hannah Stannard

Consider your code base to be the dryer and the lint to be the stuff you really shouldn't be doing. Without a linter, all that fuzz is going to be trapped in your code! If you don't take care of this lint, your dryer will catch fire, much like your code base (also known as a dumpster fire). Join me for an intro into linting and how best to use it so your code won't catch on fire.

Sell Yourself With a Software Quality Portfolio

Aaron Glass

Finding new job opportunities can be stressful and intimidating. Talking about yourself might not be in your domain. Questions of uncertainty may arise. How do I make myself more marketable? How do I separate myself from the rest of the pack? How do I keep myself fresh?

The goal of this talk is to help prepare you for what is next or what might be your future. Let's not just tell potential opportunities you have done something, you need to show them. Show them you know how to automate. Show them strategies you have used to train peers. Show them your testing strategy. Show them you have used a test management system. Your resume might be able to say these things, but why not level up and show them your body of work?

What you will gain from this presentation is tooling to increase knowledge, confidence, and a virtual portfolio that screams you should choose me!!! It will also serve as a way for you to reference your body of work from the past. So when it is time to look for your next venture or freshen up on something you did in the past, your portfolio can speak for itself.

General Session 06 - Thursday 3:30

Public Speaking For Engineers

Robby Millsap

Have you ever wanted to deliver a session or keynote at your favorite conference? Have you ever attended a really boring session and thought, "I could do better than that!" Are you terrified of getting in front of your peers? Have you ever wondered how to effectively use humor to get your point across? In this course, you will learn how to excel at public speaking, technical sessions, Q&A, and stand-up comedy. We'll cover how to make the perfect deck, submitting abstracts, using humor, and how to build your personal confidence. You will laugh, you will grow, and you will leave inspired.

User Interviews: More than Just a Conversation

Ash Banaszek

Anyone who can carry a conversation can interview users, right? Not so. Gaining insight into user requirements, needs, and frustrations is a nuanced process. Without the proper training, even well-meaning researchers can lead, bias, and manipulate users into getting the answers researchers want--instead of getting the real story needing to be told. In this talk, Ash will guide you through the basics of conducting user interviews: *Picking the right interview type* Asking the "right" questions *Do's/Don'ts of Interacting with Users* How to interpret your results User research is difficult to do well and requires lots of practice. After this talk, you should have the resources you need to take the next steps to better user research.

Learning R through sports, or learning sports through R

Mike Roznik

Big data has been a buzzword for years, but it's only recently been hitting the world of professional sports. How do sports teams use this big data? Why with R! Together we'll learn what kind of data they look for and how they present it. Along the way we'll look at real world examples of R code interpreting, calculating and presenting sports data. You'll get an overview of the cool things you can do with R and many places where you can start using it with available data sets, or your own.

Fast, Reliable, Powerful IoT Projects Built on Elixir With Nerves

Joel Byler

Elixir was built to deliver low-latency, distributed and fault-tolerant systems, this is great for large enterprise applications but can also be leveraged to build impressive IoT applications on small single board linux machines like (but not limited to) a Raspberry Pi. Nerves was built to give developers the tools they need to build embedded applications while also booting up lightning fast, maintaining a reliable file system, and allowing for remote software updates among many other amazing features. In this session we'll walk through a simple example application to show how simple it is to get a project up and running quickly. We'll also show how a developer might interact with running hardware and even push firmware updates directly to the system while it's running to see new changes reflected real time.

Fun, Friendly Computer Science

Mercedes Bernard

Computer science concepts like Big O Notation, set theory, data structures, and principles of object-oriented programming sound intimidating, but they don't have to be! This talk will dive into some fundamental computer science topics and debunk the myth that only 'real' programmers know CS.

Whether you are a code school grad, self-taught career switcher, or someone who, like me, didn't pay attention in night class, join me as we explore some computer science theory behind the code we write every day through fun illustrations and real-world examples.

TerseScript: JavaScript with 6 characters or less

Mike Hand

Let's explore the unique properties of JavaScript and learn how to write ANYTHING using only brackets, parentheses, plus, and bang. When you go back to using your full keyboard, you'll do it with a better understanding of JavaScript and some of it's, um, "features." Some of these hacks should NOT be tried at home...

The Immutable Laws of Software and Life: Code Accordingly

Cory House

The first Law of Ecology: you can never merely do one thing. Actions have side-effects. In this session, we'll explore how changes in software design can have unexpected, profound impacts. In this story-based session, I'll reference both popular and little-known "laws" of computing and life. I'll show how to use these laws to write better software. This session will give you new mental models for thinking about the tradeoffs we make in software...and life.

Microservice Patterns - Implemented by Eclipse MicroProfile

Ivar Grimstad

Architectures based on microservices introduce new challenges for architects and developers. New patterns emerge and existing are updated to be aligned to this relatively new architectural style.

This session presents a group of patterns commonly used in microservice-based architectures. Each pattern will be explained and demoed live in a down-to-earth and easy understandable way.

The patterns covered in this session are:

Microservice Architectures Service Registry Circuit Breaker Externalized Configuration Health Check API Application Metrics Service per Container API Gateway Backend for Frontend Access Token

There will be live coding and all patterns will be demoed using MicroProfile implementations.

Digging In: Getting Familiar With The Code To Be A Better Tester

Hilary Weaver-Robb

Maybe you've been testing the same application for a while, and your rate of finding new bugs has slowed. Or you're trying to find more ways to figure out what your devs are doing day to day. You have the tools at your disposal, you just need to dig in!

In this talk, Hilary Weaver-Robb shares tools and techniques you can use to take your testing to the next level. See everything the developers are changing, and learn to find the most vulnerable parts of the code. These tools and techniques can help you focus your testing, and track down those pesky bugs!

Takeaways:

tools to do static analysis on the code using those tools to find potential bugs using commit logs to figure out what's being changed that it's helpful to dig into the code of the application under test

Coaching & Communicating with Diverse Teams

Kiera Prioleau

Don't worry; this isn't the standard lecture on what diversity means and why it matters. Research shows that diverse teams are more innovative, productive, and just darn interesting. Diversity encompasses more than gender and race, which creates challenges for development team members and managers. This session will help you overcome those challenges by helping senior and junior team members communicate more effectively. You'll discover ways to tailor your communication style to fit the introverts and extroverts on your team. This knowledge will help you run effective deployments with both onsite and distributed teams. Through a production manager's case study and other real-life examples, you'll leave with actionable steps for having a more successful, diverse, and creative development team.

A Series of Unfortunate Events - What Happens When Your App is Hacked.

Joe Kuemerle

Many of us know about the various security checklists and how we should write more secure code. In this session we will move beyond top 10 lists and dive into the world of how attackers compromise systems and how they use those compromises to exploit both individuals and companies. You will see demonstrations of how a malicious actor can hack into applications and get an overview of real world exploits that steal data, take over systems and even compromise entire organizations. As we work our way through the system we will review concrete steps that you can take to mitigate similar attacks on your own systems.

What's New in Xamarin Forms 4.0

Jason Awbrey

Xamarin Forms has evolved significantly since it's debug almost 5 years ago. The recently released v4 includes many awesome new features. In this session we'll look at the latest and greatest, including Shell, Visual Design, CollectionView and CarouselView. We'll demonstrate hands-on examples of how to use them and discuss the pros-and-cons of each. And Questions!! We'll have plenty of time for questions and discussion!

Say No To Accidental Architecture! Code Your Design Systems Instead

Burton Smith

Are you still rockin' a single "styles.css" file in or project or have styles scattered throughout your project? Do you find yourself fighting to override styles or throw the "!important" property around a lot? Does your project have 20 different kinds of buttons and you don't know why or even where they are all defined? If you answered yes to any of these or just find it difficult to manage and scale the styles for your project, chances are you are a victim of "Accidental Architecture".

In this session, we will discuss how to prevent "Accidental Architecture" from happening and instead discuss the benefits of Design Systems and how they can be leveraged to create meaningful architecture. We will also introduce some tools to assess your current applications as well as a framework and an architecture that is easy to adapt and implement from one project to another.

JavaScript the Grumpy Parts

Rob Richardson

We love JavaScript, but we must admit: it's weird. Why does `this` behave as it does? How does variable scope work? Why do we have such comical behavior when comparing mixed types? Let's pull back the covers of these scenarios, and learn how it truly works. You may find a new reason to fall in love with JavaScript.

General Session 07 - Thursday 4:45

Human Readable JavaScript: Using ES2015+ to Craft Better Code

Laurie Barth

Love JavaScript? Awesome! Hate JavaScript? That's ok! In the past, JavaScript hasn't always been easy to read; lots of dollar signs and slick one-liners do not a sustainable, high-longevity language make. The good news is that things have gotten better! Lots of ECMAScript 2015 (and beyond) features are valuable additions to the language that improve its readability. Writing readable code is a win for the whole team, and this session will focus on those features of ES2015 that make code more readable to all.

The Definitive Guide to Organizing Community Events

Jennifer Wadella

Community organizing is no small feat and is VITAL to sustaining a technical workforce of learning, growth, and diversity. Since its foundation in 2013, Kansas City Women in Technology has grown to a volunteer team of more than 60 leaders running 6 technical/coding programs and several events per month serving multiple demographics and hundreds of attendees. In this session you will learn strategies on how to recruit for, build, and manage volunteer leadership teams, create + scale workshops and meetups that delight attendees, and track performance data to impress and engage future sponsors.

Twelve Spins on User Experience

Keith Instone

What is “user experience,” really? Sure, it’s that feeling people get when they interact with your software, but the term UX is being used for more than that, in confusing ways.

“We need some UX magic before we launch” “The UX team just gave us the designs, so let’s start coding” “We don’t have time for a UX process on this project” “Everyone needs to get better at UX if we want to be agile and innovate” “Hire someone with a UX degree, as long as they can also code”

In your organization, is UX a design process, a separate team, a ubiquitous skill, or a meaningless buzzword?

If people are confused about user experience in your organization, then come to learn these 12 spins on UX so that you can communicate about it better. You may also find the 12 UX spins helpful in integrating UX with agile, defining roles, writing job descriptions, adopting DesignOps, or planning the next re-org.

App Deco - Applied Design Thinking for Secure Development

Wolfgang Goerlich

Usability versus security is stupid. It forces us to choose one or the other. It excuses security breaches under the guise of usability. It automatically pits us against them, builders against breakers, developers against defenders. A better approach is to view security like usability: they happen where man meets machine. At that moment of meeting, what factors in human psychology and industrial design are at play? And suppose we could pause time. Suppose we could tease out those factors. Could we design a better experience, design a better outcome, design a better path to the future? This session explores these questions and provides a case study in applied software design. The future is usability and security. Come learn how to design that future.

Everything I Needed to Know About Debugging I Learned in Elementary Physics

Nate Taylor

Has there ever been a time where you got a bug report and you didn’t even know where to start? Have you ever felt overwhelmed with how code is behaving? You’re expecting one thing and it does the exact opposite? Situations like these can be some of the more frustrating aspects of software development. Solving problems is central to being a top-notch developer, it’s part of what separates the experts from the novices.

Over the years I’ve come to realize that problem solving isn’t always easy, but it can be broken down into some basic steps. These same steps were taught to me when I first learned physics, and have helped me solve numerous problems.

By the end of the talk, you’ll have a mental framework for solving problems, and you’ll get to see that framework in practice as we solve problems that have happened on real-life software projects.

Deep Learning on the Edge

Dan Kacenjar

Machine learning on microcontrollers? You bet! With the introduction of TensorFlow Lite, machine learning inferencing has moved to the edge... as in edge computing! Cloud-based servers or internet connections are no longer required. Machine learning can occur on the microcontroller, directly on the hardware, without network latency, or even any network connection. Let's explore how machine learning inferencing works on microcontrollers and look at some live examples.

[CANCELLED] Usability Testing and User Acceptance Testing: Do You Really Need Both?

Trent Nguyen

This session has been cancelled. We apologize for any trouble this causes.

Building Scalable, Cloud-Ready Applications with RESTier

Chris Woodruff

In this advanced session, RESTier project leader Chris Woodruff will show you how to use RESTier to build high-quality cloud-ready applications. We'll use different code generation techniques to build out the infrastructure to maximize code reuse across tiers. We'll spin up Angular and Xamarin front-ends, and maybe even try our hands at a little Blazor. It'll be a fast-paced coding session you won't want to miss!

DevOps as a Force Multiplier for Agile

Nate Berent-Spillson

So your development team uses Agile, but you keep running into process constraints because the rest of the organization is wedded to the status quo? In retros, you're constantly coming up against inefficient, manual operations? Every step of building a software product eats away at your efficiency? Sounds like a job for DevOps. If you practice Agile for better organization and faster execution but don't improve your infrastructure, you'll only expedite your sprints to a point before you hit a wall: Agile's terminal velocity. Applying DevOps to Agile increases your terminal velocity... forever. DevOps clears the field of bottlenecks so you're able to work more and more effectively without falling into the landmines of productivity constraints. In this session, you'll learn the art of making DevOps your ultimate Agile force multiplier.

Attendees will learn how to:

1. Go fast forever by automating every instance and evolve a product over time with continuous testing.
 2. Kick legacy processes to the curb to ensure no one in your organization waits on the dev process ever again.
 3. Make decisions based on data, not on guesses, to achieve a feedback loop that powers killer products release after release.
-

Mutation Testing to the rescue of your Tests

Nicolas Fränkel

Unit testing ensures your production code is relevant. But what does ensure your testing code is relevant? Come discover mutation testing and make sure you never forget another assert again.

In the realm of testing, the code coverage metrics is the most often talked about. However, it doesn't mean that the test has been useful or even that an assert has been coded. Mutation testing is a strategy to make sure that the test code is relevant.

In this talk, I will explain how Code Coverage is computed and what its inherent flaw is. Afterwards, I will describe how Mutation Testing work and how it helps pointing out code that is tested but leave out corner cases. I will also demo PIT, a Java production-grade framework that enables Mutation Testing.

Blockchain from the Firehose

Jacob Coulter

Take an in-depth look at Bitcoin, the blockchain that started it all. This session will cover all the pieces required to build a trustless distributed ledger. Learn from the most fundamental building blocks like hashing algorithms,

transactions, and blocks, to the more advanced concepts such as merkle trees and elliptical curve cryptography. Knowing when not to use a blockchain is as important as knowing when to use one. Cut through the hype of "Blockchain Iced Tea" and learn where the technology solves real problems and where it is unnecessary overhead.

Testing your UI Components

Avindra Fernando

When our clients give us kudos for releasing high quality applications, it makes us happy. To achieve great levels of quality, we need to thoroughly test our applications. But we know that some forms of testing can be expensive and tedious at times. Unit and integration tests help overcome some of the testing challenges companies are facing today. We've all heard that these types of tests help reduce bugs in new features. While reduced bugs are a great benefit, the main goal of unit and integration testing is to drive better design.

As reusable units, React, Vue, or Angular components are perfect candidates for unit and integration testing. The "Testing Library" provides a great testing toolkit, which helps simulate how the user interacts with your application.

In this session, we will explore how you can leverage the Testing Library and Jest to test React, Vue, or Angular components. By the end of this session, you will be better equipped to test your UI components and improve the quality of your application.

Horizontal Scaling of Graph Databases

Ryan Hendrickson

A very real problem is choosing what data to prioritize when storing it in a graph database. Most graph databases, including Neo4J, the number 1 graph database according to db-engines.com, do not scale horizontally. This leaves the size of the database constrained to how much disk space and ram is allocated on the single server that the graph database exists on. Due to these limitations and constraints, graph databases, in practice, only store a subset of the data - only the data which is the most valuable to be connected between nodes, edges, and properties, with the rest of the data being stored in another database solution, like MongoDB, Elasticsearch, or others. In a world of big data, cheap hard drives, and near-infinite self-provisioned cloud resources, having a single-server graph database solution is unacceptable.

This talk will explore the current state of horizontally scaling graph databases. What are the limitations? What kind of performance can be expected? Do horizontally scaling graph databases sacrifice features such as consistent replication, high availability, and fault tolerance?

This talk will show Dgraph in use on economy-sized cloud infrastructure, horizontally scaling with big data, and acting as a primary database, mitigating the need to prioritize field storage and use two databases for full data storage.

Vertical Slice Architecture

Jimmy Bogard

Moving from a layered architecture to a vertical slice architecture can be a bit daunting. We remove abstractions, complex structures, and focus building on the axis of change, then what's next? What new structures, patterns, and policies will need to be introduced in this style of architecture? How will we deal with common business functionality, and where do concepts like CQRS and DDD fit in?

In this session, we'll introduce the idea of vertical slice architectures, and dive into the patterns, tools, and techniques used with slices. We'll also cover how you can fit vertical slices into different kinds of systems, from desktop, SPA, and normal MVC applications. Finally, we'll look at some of the new challenges that come with slices and layers, and how a different approach provides a much more maintainable end result.

General Session 08 - Friday 8:30

Azure Kinect DK: Artificial Intelligence + Computer Vision = Your Next Generation Development Today!

Lance Larsen

Azure Kinect DK is most advanced Computer Vision device available for developers today!

Combining advanced depth sensor, spatial microphone array, video cameras with sophisticated computer vision and speech AI models, the Kinect is gives us an unparalleled tool for building cutting edge computer vision applications.

We'll specifically be diving into the Kinect's Body Tracking SDK - allowing for amazing kinematic and movement tracking. Think of the possibilities in Sports, Health and the Life Sciences fields -- as well as Games and other amazing user experiences!

Join Lance Larsen (Microsoft MVP) in looking how to start building your next computer vision application today!

Hack Your App - Intro to Mobile Security Testing

Hans Weisheimer

Your phone really doesn't want you to see what's going on under the hood - it's a feature. Many of the introspection capabilities that exist for web development are absent by default on mobile platforms. This is particularly frustrating when you need to validate assumptions or security controls during development.

But with a few open source tools and an unmodified device, you can do sneaky things like: - Eavesdrop on network traffic - Pilfer files, databases, and caches - Steal secrets from the Keychain - Lie to the app about security events

You will leave with a basic understanding of how to audit your mobile apps, along with a set of resources for further study. Quick reference sheets will be available to take home or download.

From Manual Testing to Automation Suite: A Guide For Everyone

Mike Roznik

Do you start with automation? Manual tests? Should you always consider both? What about working with developers, can they help? Learn some easy stepping stones to go from manual testing to getting your feet wet with automation to writing full automation suites. In this talk you can expect lots of easy to understand code snippets, lots of sources for more information, and plenty of encouragement.

Technical Leadership 101

John Rouda

We all have potential to be technical leaders. What is a leader? My daughter says it's the person in front of you in line. She's right... in a way. A leader is just someone we follow. This talk will explore how we can lead those to our right and to our left. How to lead from any level, not only as the "boss." Many people in technical leadership roles were placed there because they were good at tech... not because they have any clue about what leadership is all about. I was one of those and I had to learn to lead people. I'll share my story of failed leadership and explain the biology behind leadership...that's right biology, not psychology. We as humans have biological elements that drive our leadership tendencies. If you understand these, you can use them to become a better leader. Leadership is about training, there is no magic formula, but there are ways to train your leadership muscles, just like you would train your body.

While you're training to be a good leader, you need to understand that it's a process, not a project. We are all creative in the strictest definition of the word. We create for a living. We create solutions to problems. Our projects have a start and an end. Leadership doesn't work that way. There is no end; the end is a mirage. You're only going to get better the further along you go in the journey. Don't get frustrated; just understand that leadership is a process without an end.

Well.. that's ONNX-pected

Ron Dagdag

The world of machine learning frameworks is complex. What if we can use the lightest framework for inferencing on edge devices? That's the idea behind ONNX format. Attend this session and find out how to train models using the framework of your choice, save or convert models into ONNX, and deploy to cloud and edge using a high-performance runtime in python, C# or javascript.

People Networking 1100101

Debbie Ryan

While Networking can be scary, it is a SKILL which can be learned and honed and has a wide array of positive impacts. Job postings are incapable of giving the full picture of the job, but through networking with an existing team member it can provide great insights. Finding a new colleague that compliments other team members is nearly impossible by reading a resume. Networking with others who have worked with your prospective colleague is invaluable. Asking coworkers for help, being considered for special assignment, or promotion are related to your networking skills. Having your thoughts and opinions carry more weight is correlated with your network of people. Finding and providing value to mentees can be positively impacted by your networking skills. Join an accomplished extroverted business development manager and an introverted architect to learn actionable patterns and practices to bootstrap your networking skills to realize your goals.

Speed, security and simplicity: Creating Container Images with Cloud Native Buildpacks

Daniel Mikusa

Buildpacks are a pluggable, modular, language-agnostic tool that takes application source code and in turn give you an OCI (Open Container Initiative) image which you can run using Docker, Kubernetes or your OCI Runtime of choice.

Developers: You no longer need to worry about tedious tasks like finding trusted images, installing/updating packages, adding agents and monitoring tools and writing Dockerfiles. You write code and buildpacks take care of the rest.

The higher-level abstraction of buildpacks allows you, as a developer, to focus less time on building containers and more time being productive, writing code and providing value for your employer.

Too good to be true? Don't believe it? Come check out this session! It will explore how Cloud Native Buildpacks work, you'll see examples of how you can use them to create images from source code in your favorite languages, and you'll learn how to integrate buildpacks into common development workflows.

Solving the Boolean Identity Crisis

Jeremy Fairbank

While powerful in its simplicity and important to computation, the boolean can be limiting in applications. In this talk, briefly explore the history of boolean logic in computation and look at how booleans can become misused in programming languages. Explore examples where booleans obscure the meaning of code, make code harder to maintain, and hinder usability for teammates and users. Learn how to harness custom types and

higher-order functions to write clearer code. More importantly, learn how to place empathy and usability at the forefront of the APIs and UIs you build.

The Creative Process of Coding

Charlie Sweet

The process of writing software is often misunderstood. When you write business software you are not doing science, but rather art. Your job is not to build, but rather to design.

Designing good software is about more than writing code. Knowing what code to write requires empathy and good communication skills. But that does not mean that technical skills alone are needed to code. When you sit down to actually write code, you engage in a fundamentally creative process.

In this session, you will learn about the parallels between making art and writing code. You will learn how creating software is like creating art, in terms of the people, processes, and products. You will learn about art techniques and their similarities to programming techniques.

You will leave this session a better programmer, having gained a better understanding of the deep, creative work that you do.

Event processing without breaking production

Nathan Zender

Transactional systems are built with the primary focus of processing many concurrent events, only keeping the current state of data. What if I told you there was a way to capture all the events that led to that current state? Capturing all events would allow for deeper analytics/machine learning, debugging, auditing, and more all without affecting your production systems. In this talk we will explore the architecture, tools and patterns used to do just that. Before leaving this talk you will also learn about the stumbling blocks we ran into while implementing this against a temperamental legacy application.

The best code, is the code never written.

Daniel Davis

In the modern realms of software where getting to market fast and with minimal issues is a must in order to stay competitive, we need all the advantages we can get. One such advantage is to limit the amount of actual code produced and shipped. During this session we'll explore some of the practices, tips and tricks for helping you avoid writing the code that you never knew you didn't need.

StencilJS and Universal Components

Mike Hartington

Have you ever found an awesome component online, but couldn't use it because it's written for a different framework? For too long now, frameworks have gotten in the way of developers sharing code that they've written. With different APIs to work with, developers would have to rewrite a component multiple times to be able to work with React, Angular, Vue, or even Ember. Enter Web Components. Built on open web standards, Web Components provide a way for creating reusable components that can work within every framework, and even outside of them. Find out what Ionic's been experimenting with and see why Web Components are the way of the future.

Continuous Security

Craig Hills

A presentation on how to build security testing into your CI/CD pipeline. The primary goal is to think about what the appropriate level of testing is for your project, and determine how to make the most significant improvements to your security, while being cost effective.

Building a super performant GossipGirl.com in Gatsby in under 50 Minutes

Jennifer Wadella

Hey, Upper East Siders, Gossip Girl here bringing you the scoop on rapidly building static websites in React. I don't know about you, but my site is in a major need of an overhaul, so we're going to rebuild it in under 50 minutes using GatsbyJS. We'll make SEO look hot and blow some minds with performance testing, do you think can you handle it? I know Lighthouse can. XOXO.

Unit Testing Strategies & Patterns in C#

Bill Dinger

Learn common patterns and strategies to effectively unit test your code in C#. We'll go over design principles and ways to effectively ensure your code can be easily tested as well as how to use common testing tools such as Moq, Autofixture, & MsTest to help remove some of the drudgery of testing. Real world examples and code will be covered to give you a good foundation for making testable code for your teams & clients.

Beyond Alt-Text: Trends in Online Accessibility

Ian Forrest

If you're like the 2016 version of me, then you think you have a decent handle on web accessibility. You put alt attributes on all your images (though you don't give much thought to the actual text) and you make sure your sites can be used with a keyboard (except for overlays sometimes). Then the day comes when you're given a 100 page accessibility audit from a client and a deadline for all issues to be fixed. What is high contrast mode, you ask yourself, and why does it matter if these links are implemented in a list?

The fact is that we take for granted that people are able to use the sites we create. As governments pass legislation enforcing accessible standards, the web is playing catch up to the physical spaces we use every day. User interfaces are becoming more sophisticated, and it's easy for developers & designers without disabilities to overlook the simple things that many rely on to make sense of your site.

In this presentation I'll share some of the hard lessons I've learned over the past few years, from both a development and a project management perspective. Topics discussed will include an overview of common accessibility problems, tools I use to validate accessibility issues, and best practices for training your team.

Burn It Down and Start Again: Principles of Modern JavaScript

Joe Morgan

Heard about the latest JavaScript syntax? Seems like a day doesn't pass without a language update. And with all the focus on syntax changes, it's easy to miss the subtle principles driving JavaScript. Modern JavaScript doesn't just have new tools, it's composed differently. Don't use a feature without understanding why it matters. What problems does a new feature solve? How can new syntax make code easier to use and reuse? Modern JavaScript patterns follow three basic principles: predictability, readability, simple, and flexibility. In this session, attendees will learn how to think in modern JavaScript. Attendees will explore principles in modern JavaScript and learn how it applies to new syntax as well as upcoming language changes. Don't just throw new syntax into old paradigms. Write intentional code.

Dealing with Disagreement

Tommy Graves

Virtually everyone extols the virtues of getting multiple and diverse perspectives on almost anything. In practice, however, multiple perspectives often just lead to heated disagreements that leave technology teams feeling divided and defeated. Creating mechanisms to resolve disagreements in a healthy manner can both increase team chemistry and unlock the myriad of benefits of a diverse team.

In this session, we'll focus on a few of the most important tactics for dealing with disagreement. First, we'll take a look at the root causes of disagreement and examine how it's possible for disagreements to arise in the first place. We'll follow that up with two strategies attendees can apply immediately to disagreements: (1) disagree and commit, and (2) retrospective outlooks on disagreement. We'll look at concrete examples of how these strategies have solved disagreements and talk through not only how to apply them personally but also how to get a team on board. The result will be a robust perspective on dealing with disagreement - plus a genuinely enjoyable and productive work environment.

How Exploding Birthday Cakes and Other CRAZY Projects Come to Life

Barry Tarlton

Have an amazingly crazy idea for an Arduino or RaspberryPi project, but can't find a tutorial to help bring it to life? Do even the Googles seem unable to help you get started on the road less traveled? This session will prepare you to go beyond the average maker tutorials found online and help you realize your full and unique potential with Arduino and RaspberryPi projects. Whether you want to be a huge hit at your kids next birthday party by creating an interactive cake, you want to remotely move scenery around for the High School Musical, or maybe you want to bring your favorite video games to life, this talk will examine what's involved when you want to move beyond the obligatory "blink" tutorial and put your own bizarre spin on problem solving. You will learn how to pick the best platform for your project, powerful programming techniques, how to approach the design process, and much more. This session will educate, motivate, and blow up cake with mad science technology and creative mojo!

From Punchcards to Git: A Brief History of Version Control

Brian Meeker

Believe it or not, there was a time before Git! And even longer ago there was a time before version control itself! Come learn all about the version control systems of yesteryear, such as SCSS and RCS. Stick around to learn the horrors of file locking and versioning. Gaze into the madness that is Darcs patch theory. Escape with a broad grasp on the history of version control, different paradigms, and how we all ended up using Git today. Then we'll attempt to gaze deep into our crystal ball to envision possible version control futures.

Serialization for the new micro service landscape

Leonardo de Moura Rocha Lima

Serialization is often overlooked when developing backend systems, and this wasn't (and still isn't) a problem inside a monolith. But with the developing scene moving towards micro services, serialization becomes really important - how to serialize your data? What aspects do you need to consider? How to choose the best format and tools for your use case? Come learn about the aspects and tools to compare and select the right serialization option for your micro services!

Serialization is used by any system that wants to talk another system, even itself. Different languages have different built-in options and tools. Java, for example, has the Serializable interface and ObjectOutputStream

and many other libraries for serialization. Some play well with the native system, some are meant to be cross-platform compatible.

In this session, we'll present how to choose the right serialization option by exploring a new framework to help developers test their use cases and make the right choice for them. This covers five major areas: - size of the final byte array; - speed of serialization/deserialization; - native support by non-developer tools; - compatibility with other systems and languages; and - ease of development.

We need to use concrete examples so our serialization is complete, and for that we'll compare major serialization options in the Java/JVM ecosystem like Java built-in serialization, JSON, XML, Google Protobuf and Apache Avro, together with specific libraries for these formats, and apply them to a well known and simple use case. This comparison uses a framework to generate tests and numbers so that you're able to make an informed decision.

After this talk, we expect that the audience will be able to make their own comparisons to choose what's best for their use cases, because there's no one-size-fits-all solution when talking about serialization!

Environment Configuration for JavaScript Apps

David Truxall

For traditional server-side web apps, environment-specific configuration is handled in a variety of ways, including environment variables, configuration files or password stores. But a front-end web app running in a framework like React or Vue can't really use these same techniques since they typically run in the browser, not in the server environment. Yet they still need environment-specific configurations.

Fortunately, this problem can be breached at either build-time or run-time. This session demonstrates techniques for both, allowing you to manage your DevOps pipelines to create environment configurations appropriate to your situation. You'll see WebPack for build-time configuration and run-time solutions hybridizing known server-side solutions, as well as using containers in Kubernetes.

Context is King: Finding Service Boundaries

Derek Comartin

Are you having trouble defining service boundaries? We know there are benefits in splitting up a complex system, such as more focused models and modular deployments.

Defining the correct service boundaries is incredibly important but can be pretty tricky. When defined correctly, the model feels natural and cohesive. Defined wrong can make a system overly complex and end in disaster.

Join Derek as he explores the use of key terminology in real business systems. How dissecting simple words and asking the right questions led to insights that helped define the service boundaries in real business systems developed over the last decade.

Owning Your Experience: Talking about Mental Health In the Workplace

Arthur Doler

Your thoughts and your emotions affect your work, no matter how much you pretend that you can leave them at the door of your workplace. It's easy to deny your own experience the importance it deserves, especially if it's only inside your own head. But boxing it all away because you have "work to do" is like trying to run a marathon while carrying a Labrador Retriever.

It doesn't have to be that way. This talk will teach you how to frame your world using experiential language rather than clinical language, giving you a powerful tool to discuss your mental health in a way that can be

easily felt and understood - and that won't get you in trouble with HR. That sharing becomes the key that unlocks the true power of your team... so come find out how to finally bring your whole self to work!

API Design for ETL - Lessons from Nearly 100 Data Integrations in the Wild

Dan Mosora

In the API Economy, users increasingly want to analyze and connect more of their business data, from small startup shops to multinational corporations. Thinking about making data available through an API? There are innumerable ways to slice the problem. How do you implement pagination? What data model makes sense? What level of authentication is right to be secure, but usable?

At Stitch, we've built and reviewed almost 100 data integrations in Python for the Singer project, most of which interact with APIs, and have had good experiences ...and not-so-good experiences. This talk will explore these lessons through APIs in the wild, cover the challenges that we've faced when integrating with an API for ETL purposes, and highlight the qualities that make an API a joy to interact with.

General Session 10 - Friday 11:00

A Lifecycle Of Code Under Test

Bob Fornal

When thinking about tests against code, have you "done enough?" How do you know that the code is covered appropriately, that odd bugs aren't going to crop up? Did you cover all the use cases and what if someone changes the code down-the-road?

This session is about the unit and integration tests that a developer writes to test their code immediately, not about higher level tests that are written by a QA individual or department.

This session will examine the code and tests holistically against the various lifecycle stages of code and how the testing needs to adjust:

- Define Inputs and Outputs
 - Write Initial Test Coverage
 - Handling Bug Coverage
 - Refactoring
 - Abstraction
 - Future Work (how are tests affected?)
-

Azure Spatial Anchors: Building a Shared Mixed Reality across Devices (Hololens, iOS & Android)

Lance Larsen

Augmented, Virtual and Mixed Reality Markets are projected to exceed \$35 Billion By 2025.

One of the missing puzzle pieces in this emerging market was how to simultaneously engage multiple users across varied devices in a shared mixed reality. Azure Spatial Anchors IS that missing piece!

Azure Spatial Anchors is a cross-platform service allowing YOU to create mixed reality experiences using objects that persist at real-world locations!

So, two people can start a game of mixed reality chess by placing a virtual chess board on a table. Then, by pointing their device at the table, they can BOTH view and interact with the same virtual chess board.

We'll explore the exciting new Mixed Reality world where Visual Studio + Unity makes these amazing cross-device immersive experiences into Reality today!

Let's drink from the knowledge firehouse together and learn more together!

Finding Patterns in the Clouds

Steve Smith

Cloud computing is quickly becoming the new normal for enterprise software developers. Whether it's more traditional Infrastructure-as-a-Service, container-based deployments, or fully serverless deployments, moving to the cloud offers something for almost every organization. But with it come new challenges for ensuring your applications are robust, scalable, fast, and don't overuse utilization-billed resources. Design patterns offer solutions to known challenges that can help you quickly recognize and address problems as you encounter them, saving you and your organization time and money. Come learn a few practical patterns that will help you avoid common problems with cloud-based systems.

[CANCELLED] Watch This Talk Before You Go Go

John Reese

Session is cancelled. We apologize for the inconvenience.

You Version Your Code, Why Not Your Database?

Derek Binkley

Code versioning is an integral part of any developers daily workflow. However, database changes are often handled manually making automatic code deploys a challenge. If something goes wrong, rolling back a deployment requires either complex and possibly untested scripts or a database restore.

Adding database versioning to your development environment will help you solve these issues. In the talk you will see examples of using Liquibase to manage database changes. You will learn how scripting and versioning your database structures will allow easy, scripted deployments that can be repeated by developers, in QA, and in prod. Once you see the ease at which you can deploy database changes, you will wonder how you ever got along without it.

Android: A peek under the hood

Brad Hollander

Over the years, Android has become one of the most widely used operating systems in the world. Boasting 2.5 billion active devices, it can be found running on practically any hardware, from high-end flagship phones to smartwatches and IOT devices. Despite this massive popularity, the inner workings of Android are still a mystery to most. In this talk we'll jump on the command line and investigate a running Android system to gain a better understanding of all the things Android does for you. We'll look at what an app actually is and how it runs from the perspective of Android's Linux underpinnings, and we'll see what differentiates Android from a typical Linux distribution.

REST in Peace: Killing REST and adopting RPC.

Steven Swenson

REST has been the de facto architecture for web APIs for 15 years, and its deficiencies are starting to become quite apparent. It is difficult to document, poor standardization, and lacks common tooling. For developers, this results in extra work when creating or consuming an API. The time has come for us to kill REST and start using RPC architecture. This talk will discuss why REST is deficient for modern applications and how adopting RPC can reduce development time, and reinforce more rigorous design standards. Using better standards

leads to faster development, easier testing, and auto-generated clients. These points will be illustrated by comparing a simple API implemented in both REST and in gRPC, a standard created by Google. Other RPC standards will also be reviewed and compared to gRPC.

Explain it to me like I'm 5: Oauth2 & OpenID

Daniel Mikusa

Oauth2 and OpenID are quickly becoming mainstays for application developers. Companies want integrated authentication to reduce security footprints and users expect the convenience of single sign-on. As an application developer, it's up to you to facilitate this in your applications.

In this talk, you'll learn about Oauth2 & OpenID starting with their basic concepts presented in the simplest light possible. From there, the session will take a practical focus, showing what you need to know as a developer, the tools and libraries that will make your life easier and, of course, concrete examples in Java, .NET and for static apps.

The Dark Side of UX

Courtney Heitman

User experience design brings clarity, removes obstacles. It rewards - makes us feel accomplished, successful, happy. Users are confident when using a well-designed application - as easy as turning on a light switch: [Buy]

Don't make me think: did I opt in? Don't make me think: was that a hidden fee?

We will explore the wild world of user manipulation. The Bait and Switch. Trick Questions. Misdirection. Confirm-shaming! Discover the latest ways UX designers trick their users, how easy it is to do by accident and how it affects your brand.

[Sounds great] [No, I hate knowing things]

Assembly Language: The (Sega) Genesis of Programming

Joe Sewell

Have you ever wondered how many popular video games of the 70s, 80s, and 90s managed to look, sound, and play so well, despite running on very limited hardware? One reason is that many of these games were written in assembly languages. Unlike compiled or interpreted languages, in assembly the programmer manually decides the CPU instructions the program will execute. This "by hand" approach, while difficult, allowed game developers to maximize their use of the hardware and reduce the cost of expensive cartridge memory. This session dives into the ancient art of assembly programming, with the Sega Genesis (a.k.a. Mega Drive) as an example. You will learn the basics of assembly languages and the unique quirks of video game hardware of the era, with examples from a homebrew Genesis game written in Motorola 68000 assembly. You'll leave with a deeper understanding of computer architecture, the knowledge of what situations call for assembly programming, and the gratitude of being able to use higher-level languages in all other situations.

Hiring and Inspiring an Exceptional Team

Seth Petry-Johnson

Management gets a bad rap in technical circles, and for good reason: many managers are terrible, and it shows!

Rising above the pointy-haired-boss stereotypes is easier than you might think. By grounding your leadership style in management science, and adding a touch of emotional intelligence, you can help your team meet its individual and collective goals, improve morale and engagement, and reduce turnover.

This session will show early-career managers how to find team players aligned with their core values, how to "design the alliance" with new hires, how to get the most out of 1:1s, and how to use personality-typing tools like DISC to motivate and communicate effectively.

Development magic: Producing more development time out of thin air.

Jonathan Batteas

It's easy to get stuck in the, "if it ain't broke, don't fix it," mindset with your software development process when real money is on the line, and deadlines loom. But taking the time to implement small changes to your pipeline, and foster a team attitude that's always looking for a "better way" can lead to a dramatic shift in productivity. You'll learn how one group of developers, under serious working constraints, decided enough was enough, and started reshaping the way they thought about their decades-old development practices. Small changes lead to bigger changes, and faster adoption. The result is a dramatic out-performance of peer departments, and more importantly, their own past delivery. If you want to pull more time out of thin air, you can't afford to stop examining your own process.

An Introduction to Quantum Programming

Matt Norby

Quantum computers can solve some classes of problems much faster than conventional computers. But the terminology can be confusing. What are qubits, superposition, and entanglement? And how can you harness them to write programs? In this session, you will learn the language and concepts of quantum, and understand what classes of problems are well-suited to quantum computing. We will look at sample algorithms, debug a sample program with a simulator, and finish with a live demo running on an actual quantum computer in the cloud.

General Session 11 - Friday 12:15

Understanding the identity business, and how to get out of it

Jeff Putz

Knowing who is using your software is super fundamental. It's less important than ever to have to manage those identities yourself, but you can't escape understanding the protocols and players. Let's talk about how things like OAuth2 actually work, and then decide if you can get out of the business of knowing that at all. Cloud services, on-premise software and existing open source projects can all help you limit your exposure to exposing your users.

User Experience Pitfalls

Ash Banaszek

User Experience has become a buzzword in the tech industry. Project managers and business partners are clamoring to improve the experience. You understand UX is a business necessity, but you aren't quite sure what it means to you or where to begin. This session discusses some common pitfalls of user interface design and simple techniques to inject UX into your applications from the start. These are the basic UX design principles you need to start adding UX to your project today.

Quantum Computing deep dive

Johnny Hooyberghs

You've probably heard of Quantum Computing, but it still remains a mystery? This deep dive session explains important concepts like qubits, superposition and entanglement. Theoretical knowledge about quantum physics, quantum gates and quantum algorithms will be associated with practical examples using a real quantum computer on the IBM Q Experience and simulated using Microsoft Q#.

Calculating Insulin With Automated Carb Counting Using AI, ML and Web Bluetooth

Todd Sharp

Diabetes is a disease that affects 400 million people worldwide. Managing the disease means eating a healthy diet, getting routine exercise, monitoring blood sugar levels and administering insulin to manage those levels. The good news is that technology exists to help people manage the disease. Continuous Glucose Monitors, Insulin pumps and even open source "artificial pancreas" solutions exist and help diabetics to manage their blood sugar levels with very little time and effort. All of these technologies make life easier, but they all still require the user to manually calculate and enter their carbohydrate consumption in order to calculate the necessary insulin dose.

My 13-year-old daughter was recently diagnosed with Type 1 Diabetes and we have been slowly learning how to help her manage the disease. I was inspired to try to help solve the problem of carbohydrate counting so I came up with a Progressive Web Application that can be used to automate that process using things like image recognition, machine learning, web bluetooth, microservices and more. In this session we'll look at some of the technologies behind the application and how they all work together to try and solve the difficult problem of counting carbohydrates in order to calculate a necessary insulin dose.

Not Just Fun and Games: Creating a Chess AI That Can Beat You

David Hauck

AI is in the news seemingly every week. Whether it is people like Elon Musk or Steven Hawking warning the public about them or a new program that can beat humans at yet another task, it is definitely a hot topic. This talk will go through how an AI program that can play chess is actually made. Using fundamental data structures and algorithms (without machine learning), the AI will start from the ground up and use audience knowledge of the game to make it an exceptional chess player! Afterwards, attendees can attempt to beat the AI that was built.

Supporting the Scala Ecosystem: Stories from the Line

Justin Pihony

At Lightbend we have handled over 10,000 customer support cases ranging from simple Scala compilation issues to complex Akka performance puzzles. Supporting Scala and its largest libraries has resulted in some really interesting issues, such as:

- a seemingly valid cast leading to a `ClassCastException`
- handling external communication with Akka Cluster
- a subtle workaround to a `SecurityException` bug in Play

This talk aims to have something for everyone, whether you are just looking to hear some mind-bending stories or proactively learn how to stay out of these situations yourself.

DDoS Attacks: Threat Landscape & Defensive Countermeasures

Chris Holland

October 2016's attack on Dyn's DNS infrastructure was a gloomy wake-up call to the online community at-large, depriving us access to some of the online destinations and applications we use every day, thereby confronting us with the stark reality of an old and ever-growing threat with which the InfoSec community has been grappling: DDoS Attacks.

As we look at the role that 'Internet of Things' devices played in the attack against Dyn, as well as the attack against Krebs prior to it, we will dive into the DDoS attacks Threat Landscape: Symptoms, Motivations, Business Impact & Attack Vectors. Having thereby gained a better understanding of our exposure to these threats, we'll then explore Defensive Countermeasures with a strong emphasis on preparedness ahead of these attacks, including:

Reducing Attack Surface Monitoring: Availability, Performance & Search Engine Visibility DNS Redundancy Planning Web Application Scaling Strategies Mitigation Vendor Fit Assessment Attack Mitigation Attendees should walk out of this presentation with:

A better understanding of what DDoS attacks are and how they work. A better understanding of their exposure to such attacks. A set of concrete steps to better prepare ahead of an attack for more effective mitigation.

Hey, You Got Your TDD in my SQL DB!

Jeff McKenzie

When should we test our data? From an application development perspective, a unit test against a database isn't a unit test at all. Which makes sense -- connected systems introduce overhead and dependency, both of which reduce stability and decrease productivity during test-driven development (TDD). But if we wait for integration testing, critical functionality can get missed. In this session, we will discuss strategies for filling the data testing gap, directly within a Microsoft SQL Server environment. If you do a lot of work in T-SQL but aren't familiar with TDD, you'll learn the why and how of test-first development. If you're accomplished with unit tests, but never tried them in your database, you'll learn how to apply familiar concepts like setup, mocking, and assertion. We'll spend most of our time walking through a solution based on a real-world project, specifically using the open source tSQLt database unit testing framework.

Will the real "Women in Tech" Please Stand up ??

Taranjeet Kaur

Some stats (the data has been gathered from multiple sources) -

Fact#1 50.52% women in USA Fact#2 47 % women in workforce Fact#3 Only 20% women in Tech Job Fact#4 5-7% management/ non tech positions in Tech companies.

So many "Women in Tech" events and "Women Hiring" drives in Tech Companies, still even in 2019 we haven't been able to bridge the gap. It's time to do some REALITY CHECK and solving this problem once and for all , to leave a strong tech legacy for future generations of women.

This session will talk about approaching formative years differently for the girls in our community and how it can be a potential game changer which could guarantee that the next generation of Women workforce proudly see themselves as Technologists / Tech mentor. It will also give an opportunity to retrospect on the 'Gender bias' which exists in Technology even today and discuss on why it is a mere symptom of a bigger problem and not the entire problem itself.

React State: Redux & Context & Hooks, Oh My!

Michael Moran

In the age of ephemeral javascript frameworks, ReactJS has lasted 5 years and only grown in popularity as its evolved. Despite its popularity, there is one burning question for anyone working with React: "How should I handle state?". We have many options at our disposal including React component state, Redux, the React Context API, and even the new React Hooks. These tools are not mutually exclusive and can be used in tandem to make handling state easier for your team. We'll compare examples of each of these methods so you can feel empowered to make a more informed decision when planning your next react project or reevaluating your current codebase.

Practical Functional Programming

Jeremy Fairbank

Functional programming is more than just math and monads. Functional programming empowers developers to solve real problems with safe, predictable, and maintainable code. In this talk, discover the basics of functional programming and how to apply functional concepts in a practical manner. Learn how pure functions are easily testable, how to compose specialized functions to create more complex functions, how immutable data prevents bugs, how to prevent runtime errors with static types, how to safely model nulls with special types, and more! Most importantly, leave this talk with a deeper understanding and appreciation for functional programming to start exploring it yourself.

Make For Non-C Programmers

Eric Smith

GNU Make is a robust, proven, and free tool that's been available for decades for automating virtually any task imaginable. Yet it's rarely used by non-C programmers, because its documentation was written for...C programmers.

In this talk we'll approach Make from a beginner's point of view, and demonstrate how it can be used to easily automate tasks from CI to monitoring, covering a ton of the poorly documented "gotcha's" along the way. After this talk you'll finally be able to use one of the most ubiquitous tools in the software engineering field, rather than writing yet another automation solution.

A Developer's Introduction to Electronics

Guy Royse

Are you a programmer? Odds are you have a love of Raspberry Pis, Arduinos, and other devices of their ilk. These devices are easy to program, especially for a developer like you, but when it comes to building circuits for them to control, you're pretty much just following recipes online without a lot of understanding of what's going on. This talk will correct that.

In it, I'm going to explain the basics of electronics and the components that are commonly used to build circuits. I'll start with Ohm's Law and will then cover basic components including resistors, diodes, capacitors, transforms, relays, and transistors. I'll use these components to build some basic circuits and explain them. And, I'll control these circuits from an Arduino and my laptop to show them in action!

When we're done, you'll be able to build circuits that you can use for your own projects *and* have the knowledge on how they work. You won't know everything, but you'll have a wonderful start in learning to make *and understand* more complex circuits!

General Session 12 - Friday 2:45

The Dungeon Master's Guide to DevOps

Bill Dinger

Every good Dungeon Master needs a guide to help their party adventure through the world of DevOps. From the tools necessary to common monsters found along the way. Help your party succeed at a critical part of delivering quality software.

We'll go over the full CI/CD cycle: builds, commit hooks, static code analysis, pull request review tools, automated linting, QA/Security/Release automation and build automation. Gained from years of practical experience I'll share what has worked best on projects cross industry and from teams ranging for 2 to 140.

5 Ideas For Writing Better Cloud Native Microservices

Todd Sharp

In theory, microservices are easy. The promise of loosely coupled, scalable services that can each be independently built, tested and deployed sounds amazing, doesn't it? On top of that, each service can be written in whatever language the development deems appropriate – using their framework of choice – without any consequence to the rest of the architecture. Java services mixed with Node, Go, Ruby with each potentially persisting data to a different datastore. Maybe the Java service uses a key/value store? Perhaps the Go service persists to a traditional RDBMS? The future has truly arrived.

But in reality, microservices can present a new set of challenges for developers. Things that used to be easy like simple queries that join data from multiple sources are now handled differently. Tried and true concepts like transactions, referential integrity and DRY no longer mean as much when it comes to microservices. This new way of thinking can be difficult to grasp for some developers.

In this session, I'll show you some new ideas that you may not be familiar with that will help you develop performant microservices that are easy to maintain. Some of what we'll cover will look at new ways to solve some of challenges that microservice development brings and we'll discuss the benefits and downsides of each approach. I'll deploy a simple set of microservices using several languages and frameworks and we'll look at how to share data between the individual services and create a service that combines the data from multiple sources into a single feed of data. We'll also touch on other cloud native features that fit into your microservice application like serverless functions and cloud events.

Walking A Mile In Your Users' Shoes

Jameson Hampton

Developing apps for users in different demographics is inherently differently than developing apps just for ourselves and for other programmers. Understanding the needs of our users and learning to foster empathy for them is just as much of a skill as learning Rails or ActiveRecord — and it's a skill that's relevant to all developers, regardless of their ability level or rung of the career ladder.

One of the reasons that tech is a cool industry to work in is because “working in tech” doesn't really confine you to working in the tech industry. Everyone needs applications! I consider it a perk that I can use my background in software engineering to work as a technologist in other industries because it gives me the opportunity to find a job I really care about, doing something I really find important.

But even if the code itself is more or less the same, different applications have different user bases. People who work at a company like Github, for example, can work under the assumption that most of their users are fairly similar in many ways to themselves. If their application is intuitive to them, it's likely to also be intuitive to most of their users. Even within tech, that may not always be the case, particularly because different people have different accessibility needs. But when you're working in other industries, it's often much less true that what “works” for you as a programmer will also work for your users.

This talk, which will focus mainly on low-tech solutions, UX, and requirement gathering, is intended for developers at any skill level but will be of particular interest for people who do product work in non-tech industries. I'll be using agriculture and healthcare as particular examples, but the advice is the same for anyone who works on any app that isn't primarily targeted to other programmers and technologists.

Trans Eye for the Cis Ally: Ensuring an Inclusive Community

Julien Fitzpatrick

Trans and non-binary people are becoming increasingly visible in the workplace, as well as in community spaces such as meetups and conferences. Most managers and event organizers want to be inclusive and welcoming but frequently, in spite of their best intentions, often come up short. Wouldn't it be nice to have an actual non-binary trans person just tell you what you should be doing and why? VOILA! Allow me to swoop in and fix your interview process, your community event, even your office space! Can you believe? Shamazing!

Mock It 'til You Make It

Gabriela Dombrowski

Let's automate the tedious task of building mocked query resolvers so that you never have to manually set up mocks for loading, error, no data, or default value states ever again! We'll learn how to use GraphQL and Apollo in a React application to build providers that will dynamically auto mock all the things for tests and stories.

This talk assumes the audience has prior knowledge of React and GraphQL.

One Codebase, Many Screens - Flutter in a Nutshell

Don Ward

The Story - Flutter is Google's cross-platform development framework for quickly crafting high-quality native apps on Web, iOS, Android, and ChromeOS in record time.

Flutter works with existing code, is used by developers and organizations around the world, and is free and open source. Notable apps written in Flutter include Abbey Road Studios first mobile app, Topline, the Hamilton Broadway Musical app, and Alibaba's Xianyu mobile app.

Flutter breathes a breath of fresh air into the cross-platform development scene for many reasons which we will cover during the session.

In particular, the session will cover,

1. What is Flutter?
2. Why should you consider Flutter?
3. What makes Flutter different?
4. What you need to get quickly started creating great apps.

Along with the code snippets demonstrated during the talk, attendees can follow up afterwards at their own pace by using the code in a GitHub repo with all of the source code and the presentation (similar to this -> <https://github.com/donwardpeng/Flutter-DetTechWatch>)

The Call To Action -> Have an idea for a website or mobile app? You seriously need to consider creating it using Flutter. With the multitude of platforms it supports (from one codebase!) to the ease of getting started to create beautiful apps, Flutter is one of the first cross platform development frameworks to deliver.

What Time Is It Anyway?

Tyler Jennings

Handling date and time in our applications can be a complex task with many nuances. How should we handle date time? Should we store local time zone or UTC? Should we store dates and times separately? Should we

use Unix time? These are all valid questions and there isn't always a one-size-fits-all solution. In this talk we will take a look at the challenges that date and time present to us, the different scenarios we might run into, and how we might solve them in our applications. We will look at the pros and cons of different approaches and see which approach might be best in various circumstances.

Becoming a Better Curator of Your Code

Ian Zelikman

Writing code that functions correctly is only part of the development process. The majority of our time is spent reading, maintaining and refactoring our code. In this talk we will discuss how when we see our work as code curation we actually enable our job to be much easier and productive.

We will start the talk with an introduction to the role of a curator and how it applies to software engineers.

In this talk we will discuss some principals and techniques that enable us to produce better code but applying them with the curation mindset of maintaining code quality beyond producing the next bug free feature.

Some of the topics we will cover:

- Promote the use of conventions and style guides for your team
- Promote refactoring in order to keep your code maintainable and readable
- The first goal of writing tests should be to document the code functionality
- Describe your code history via commits
- Encourage discussion on feature implementation
- Encourage discussion during code reviews
- Boy Scout rule - leave the code in a better shape than which you found it

At the end of the talk we will review the software curation mindset and how you can bring it to your organization.

The goal of this talk is to inspire attendees to take the curation mindset with them whenever they develop code. Focus not just on individual feature but on how to continuously create maintainable and stable code you can be proud of.

Programmer burnout: how to recognize and avoid it

Santosh Hari

Burnout among software professionals is far more widespread than we would like to admit. It sneaks up on us. At first we dread going in to work each day. We can barely focus enough to get through the day and struggle with otherwise simple-for-us tasks. It starts there and gets much worse. So what are some of the things that cause us to burn out? We will draw from personal experiences and have a frank and productive discussions on some of the well-known, and not so well-known causes of burn out, how to recognize the symptoms, how to avoid getting burned out and some tricks on coping.

Designing a DSL with Kotlin

Nicolas Fränkel

Although Kotlin has made a huge impact on Android, it's equally good on the server side. As Domain-Specific Languages are constrained by the language they run on, Kotlin frees developers from Java fluent builders to

propose something better.

Using the Hazelcast configuration API as an example, I'll demo how one could design its own DSL with Kotlin.

Git Back to Basics

Angel Thomas

Have you written code that worked, then broke it, only to not remember what the working code was? Git, a version control application could be the solution you are looking for. Git can help you to track changes in your projects, go back to when your code is working, or even find out where it broke. You can use it in collaboration with a team or as the only developer on a project. Learn the commands that are used every day as well as a few that can help you recover from mistakes.

Building an Open Source Artificial Pancreas

Sarah Withee

Have you ever thought about what open source software or hardware could achieve? What if it could help improve people's lives by solving some of their health problems?

After the medical tech industry kept promising a system to help automatically manage insulin for type 1 diabetic people and never delivering, some people got together to find ways to do it with the tech they already had. Over the past few years, a "closed-loop" system has been developed to algorithmically regulate people's blood sugars. After reverse engineering bluetooth sensors and 915 MHz insulin pumps, the system became possible. As a diabetic, I also built this system and saw my sugar values stabilize much more than I could ever achieve doing it manually myself. Now I'm working on contributing back to the projects as well.

I want to talk about this system, from a technical side as well as a personal side. I'll talk about OpenAPS (the open artificial pancreas system) and how it works, what problems it solves, and its safety and security concerns. I also want to show how it's helped me, and what this means for my health now and in the future. I ultimately want to show how we, as software developers, can change people's lives through the code we write.

Hacking on a home server for fun and profit

Leo Guinan

Do you have a Raspberry Pi or similar just gathering dust at home? Or maybe various other computer components hanging around? If you do, come join Leo's journey down the road of system administration, beginning with an assortment of Raspberry Pis, and current in the form of a rack server. He will walk through the process of picking components, setting up a penetration testing lab, and a home automation portal. Finally, he will share how this experimentation has affected his career path, and his recommendations for getting started.

General Session 13 - Friday 4:00

Watch How The Giants Fall: Learning from Bug Bounty Results

John Melton

Security is hard. We all miss things. Attackers find things.

"You must learn from the mistakes of others. You can't possibly live long enough to make them all yourself." - Samuel Levenson

This talk is a fun, fast-moving survey of some of the best recent bug bounty finds against some of the largest and best-known applications in the world. Some of the bugs are really simple, some are super complex, but all are entertaining. As we go through these, we'll take a look at what caused the issue, and how to fix it.

From this talk, you'll walk away with: *a few minutes of entertainment* a view of the wide breadth of security issues *practical ideas on testing and shoring up security in your own applications* (maybe) a new side gig as a bug bounty hunter!

The Hows and Whys of Podcasting in 2020

Leo Dion

In 2017, Leo started a podcast ok productive with his co-host Erik Gillespie. A few months later he started another podcast empowerapps.show to compliment his business developing apps for Apple devices. In this presentation, Leo gives some guidance on how to get started as well as: fostering audience growth: hosting and publishing, equipment upgrades, improving notes, consistent scheduling, and more... He'll also talk about podcasting as a great way to market yourself and your skillset.

Accessibility Audits in Chrome: Easy Steps toward an Inclusive Internet

Maranda Provance

Do you want to help make the internet a better place for all people? In this talk, you'll be introduced to the accessibility audits built into Chrome's dev tools. We'll walk through the automated tests they provide as well as the helpful information they give on manual testing. By the end of the talk, you'll have a high-level understanding of what accessibility is, why it matters, and how you can help people with disabilities make their way around the internet with ease. Let's do some good!

The Case of the Tenacious Tester: How Using Your Words Improves QA Work

Katrina Ohlemacher

"Never trust to general impressions, my boy, but concentrate yourself upon details." So says Sherlock Holmes in "A Case of Identity." The Great Detective has a lot to say that applies to software testing: pay attention to detail, never make assumptions, use your imagination. We wouldn't have Sherlock Holmes without good writing and great storytelling, and this talk has a lot to say about how using your own writing and storytelling skills makes for better reporting, better reproducibility, better team dynamics and better overall testing. Katrina will cover note-taking, bug reports, client communication and more, all with help from Baker Street's most famous resident.

Test-driven development: save your time, save your sanity, write great code fast

Paul Roub

For the skeptical: Both new and more-seasoned devs -- especially solo practitioners -- can have a lot of misconceptions about TDD. Mostly of the "it's extra work, it's extra code, I can't ship tests, why would I test something simple and obvious" variety. But magic happens when the light bulb switches to "on". Walk through the design of a simple-enough class, showing along the way how initial assumptions are often wrong; how to avoid making those assumptions too early; throw away less code; and feel comfortable and safe when you *do* throw away code.

Straying From the Happy Path: Taking Control of Errors in Swift

Jeff Kelley

Have you ever seen a code comment saying “this should never happen”? Have you ever wondered what would happen if it did? Swift has a diverse set of error-handling capabilities, from using throw to send errors up the stack to using a Result to handle errors in asynchronous methods. In this talk, we’ll look at the landscape of handling errors in Swift, create new ways of expressing and handling them, and show how even the most impossible code-level situations can have 100% test coverage. By the end, you’ll be taking control of the errors in your code, instead of letting them take control of you.

Example Mapping: The New Three Amigos

Thomas Haver

Example Mapping is a collaboration technique used by teams to help refine requirements. Every team should have a set of “ready” criteria that includes some kind of workshop between development team members to establish a shared understanding. In a time-boxed Example Mapping session, rules will summarize examples or constraints about a user story, and questions about outcomes or dependencies are documented for future refinement. The end result are requirements written as user behavior with a shared understanding among all roles on an Agile team. The audience will participate in a live Example Mapping session and learn how to implement the workshop within their own team.

Thirst-quenching Streams for the Reactive Mind

Mary Grygleski

With the advances in multicore hardware and virtualization technologies, and the demand for highly responsive, resilient, and elastic systems and increasingly sophisticated applications, an array of reactive data stream processing libraries have been born to address the needs. Reactive Streams is an initiative to provide a standard for asynchronous stream processing with non-blocking back pressure. This encompasses efforts aimed at runtime environments that include JVM and Javascript, as well as network protocols. So how do the various library implementations of Reactive Streams, such as Spring Reactor, Reactive Extension (Rx)'s Observables, and Akka Stream, stack up against each other?

This presentation will go into some details on how streams leverage on the underlying multicore processor to achieve parallelism. It will then explain the push vs the pull streaming model. It will then use a simple use case with code examples to illustrate the different API usages, as well as runtime processing analysis between a few popular Java implementations of Reactive Streams.

Raiders of the Lost Query: Learning Best Practices for Exploratory Data Analysis in R Programming

Pierre DeBois

Indiana Jones had his hat, his whip, and his wits to save the day. But developers and managers need a lot more to program data models.

With so many dataset tools for data science available, managers and developers can create statistical programming models, but are overwhelmed as to how to best explore the dataset. Most professionals conducting data science spend a majority of their time exploring and cleaning data. Databases are increasingly containing semi-structured data, thanks to varied sources such as social media, mobile devices, geolocation, and attributes describing real-world structures. Being able to blend data from a range sources and create useful correlation require some knowledge as to know when to apply exploratory steps effectively.

This brief talk will show how attendees can better plan for speedier analysis of datasets so that developer/manager teams can develop better regression and machine learning models. This session will cover the querying features in popular data repositories (Kaggle, data.world), data exploration techniques using libraries and functions in R Programming, and ideas to systematically communicate with team members on the data exploration process.

The end result is a faster means to establish a better quality dataset, leading to better analysis for regressions, machine learning models, and other data science projects.
