




*Software Development
Engineer Internship at
Chesapeake Technology
International*

Jacob Duncan

Introduction

- Name: Jacob Duncan
 - Major: Computer Science
 - Minors: Mathematics & Data Science
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Background of CTI

- Founded in April 2000 by Dustin Hellwig
- Intent: Provide user-focused, high-end software and systems development products for the Defense and Intelligence communities.
 - Headquarters: California, MD
- Other locations: San Diego, CA. Camarillo, CA. Santa Barbara, CA. Denver, CO. Chantilly, VA

Products at CTI

- CTI almost exclusively takes private contracts from the government
- Very recently started contracting publicly through other companies
- WEAVR (product I worked on) was one of CTI's first software products they had ownership of



Size of Company & Company Environment

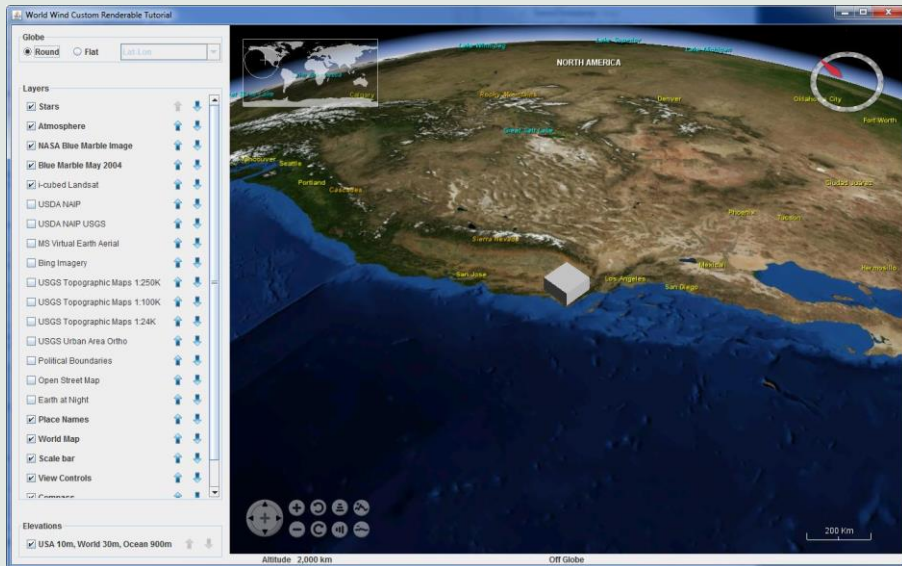
- CTI has just over 100 employees (from all around the world)
- Many of these employees are veterans or ex-military members
- CTI is very active in the TAK product center and attend meetings all over the world to demo our software

Introduction

Interview

Onboarding

- Reached out via website contact form
- Soft skills interview with Director of Technology
- Given take home coding question
- Technical interview to review code and demo
- Hired as remote Software Development Engineer intern in February





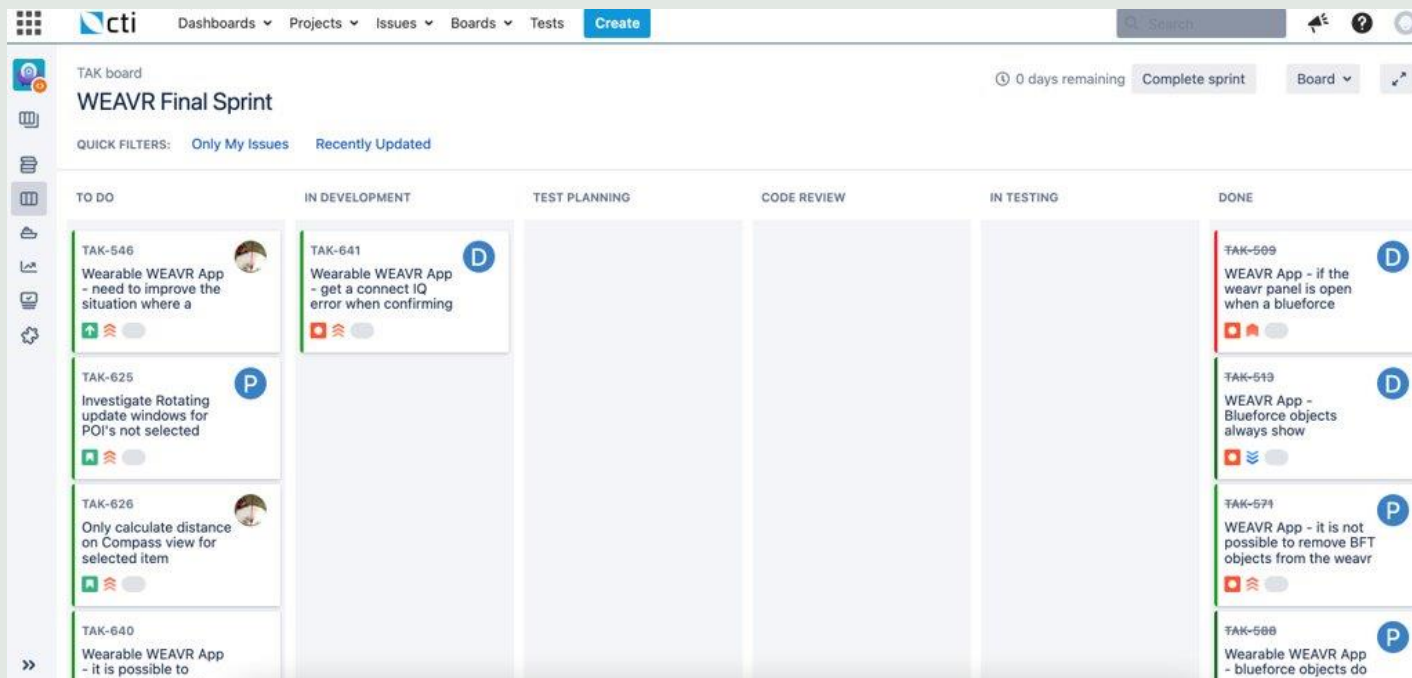
Devices

- Apple Macbook Pro 2015 Work Laptop (Left)
- Samsung Galaxy S20 (Middle) aka EUD
- Gamin Fenix 6x Pro (Right) aka Wearable

Team placement & co-workers

- Placed on team WEAVR upon entering company
- Team consisted of 6 people at the time
 - 1 Product Manager
 - 4 Software Engineers (including myself)
 - 1 QA Tester
- The team members and size changed multiple times since I've been on it

Development Workflow



- Agile development
- Jira for kanban board, ticketing system, and swim-lanes
- Complete task or bug fix
- Push code to GitLab and request review of MR

Wearable Awareness Viewer (WEAVR)

- Initially called TAKWatch, the project I was put on upon entering the company as an intern was WEAVR.
- WEAVR was created as a solution to a problem that many soldiers using ATAK were having (explain the problem)
- WEAVR consists of 2 technologies
 1. ATAK Plugin
 2. Native Garmin Application

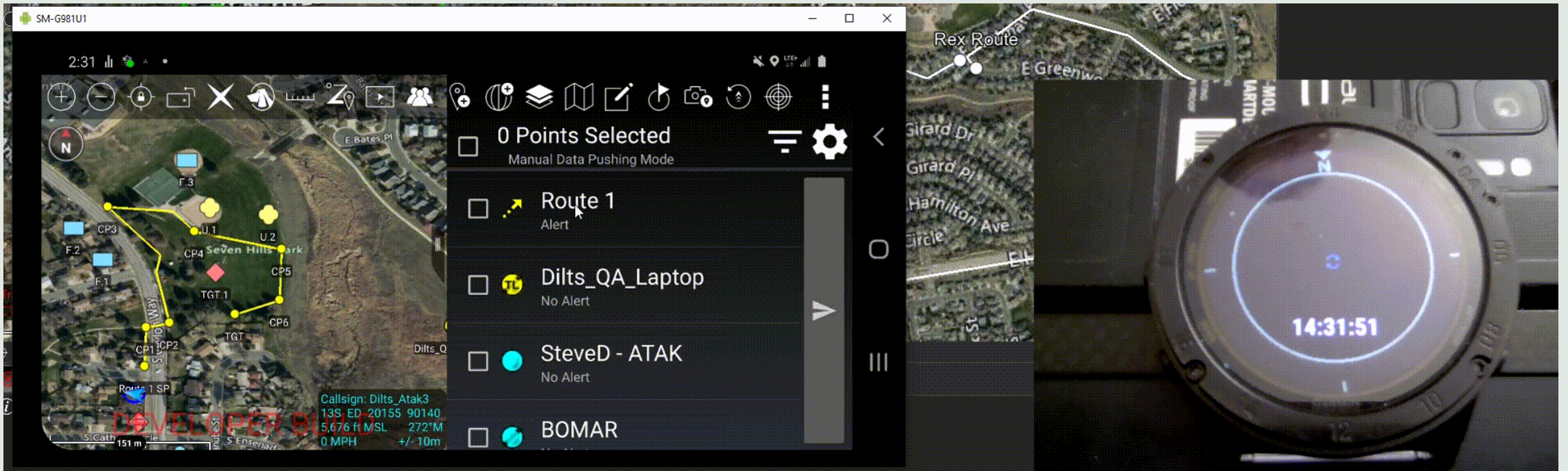


ATAK: Android Team Awareness Kit


- Android smartphone app
- Allows for precise targeting, land formation intelligence, situational awareness, navigation, and data sharing
- This android app is part of a larger TAK family of products



How WEA VR solved this issue



Responsibilities in WEAVR

- Support team members in coding & research efforts
 - Write thorough notes on my process to complete tasks or setup
 - Actively review Merge Requests via GitLab code repository
 - Contribute new and innovative ideas as well as share my progress in daily standups
 - Take on upwards of 60 story points per sprint
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Notable Contributions

- Live map sync



Live On Screen Filtering

Duncan, Jacob authored 4 months ago and Dilts, Michael committed 4 months ago

- Render routes and route segments



feature/TAK 308 - Route Navigation functionality (stand alone & integration...

Duncan, Jacob authored 3 months ago and Dilts, Michael committed 3 months ago

- Sync route progression on watch with ATAK

- Persist routes



Persisting RR Distance on WEAVR shutdown

Duncan, Jacob authored 3 months ago and Dilts, Michael committed 3 months ago



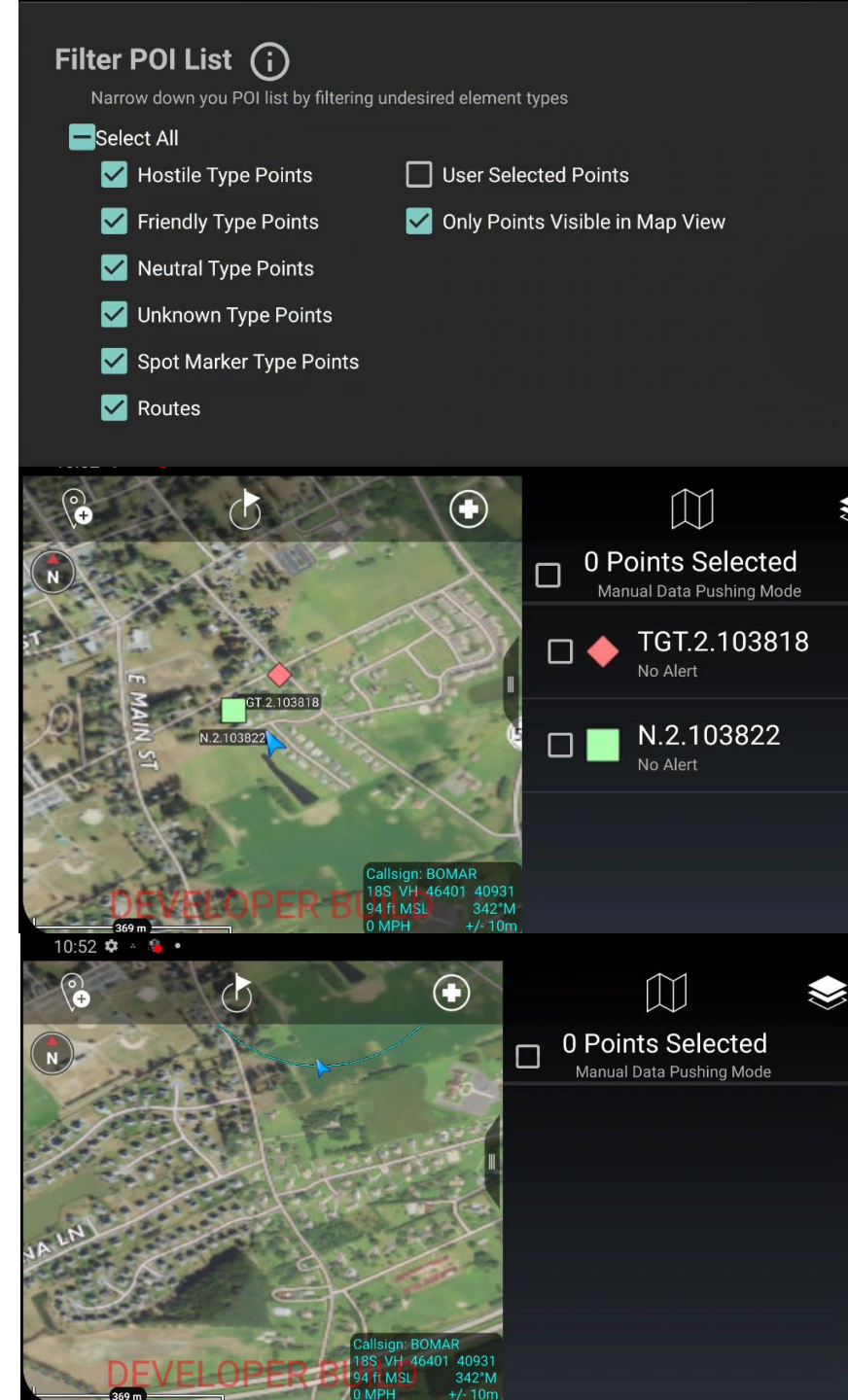
TAK-622: Default Selectable to True && TAK-637: Fix Route Persistence

Duncan, Jacob authored 2 months ago and Pompelia, Cory committed 2 months ago

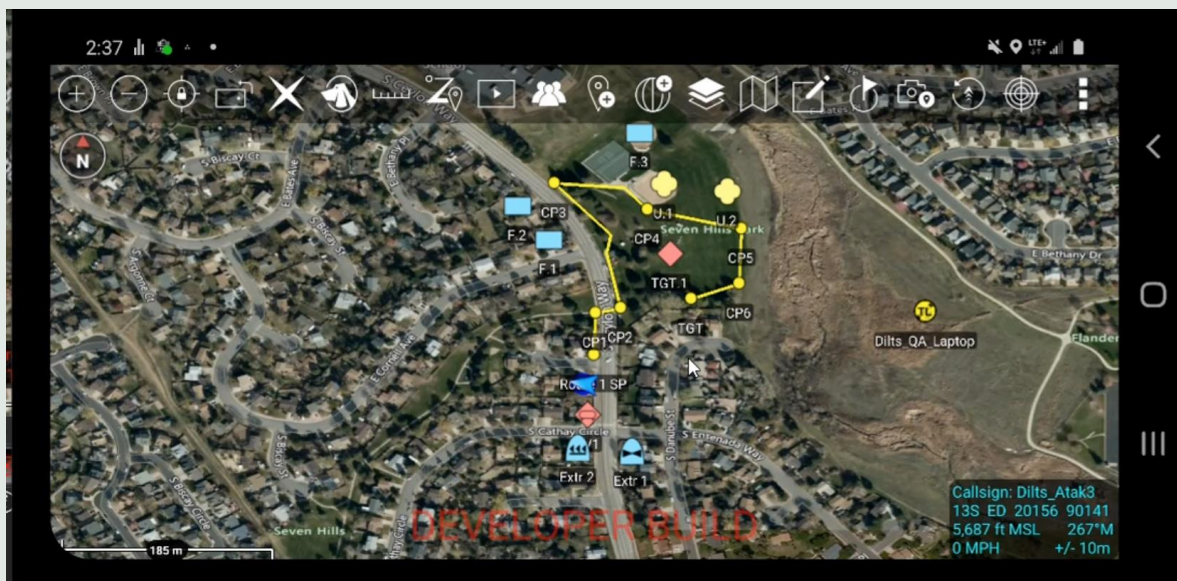
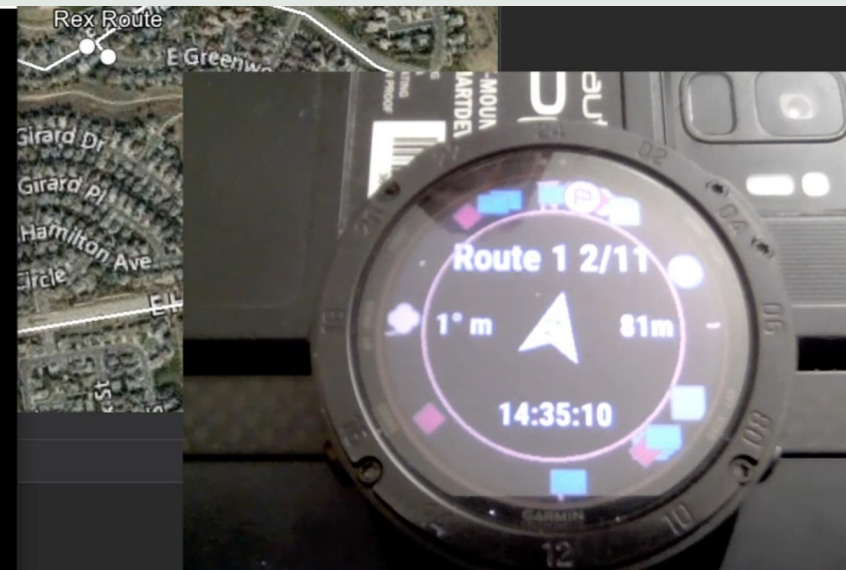
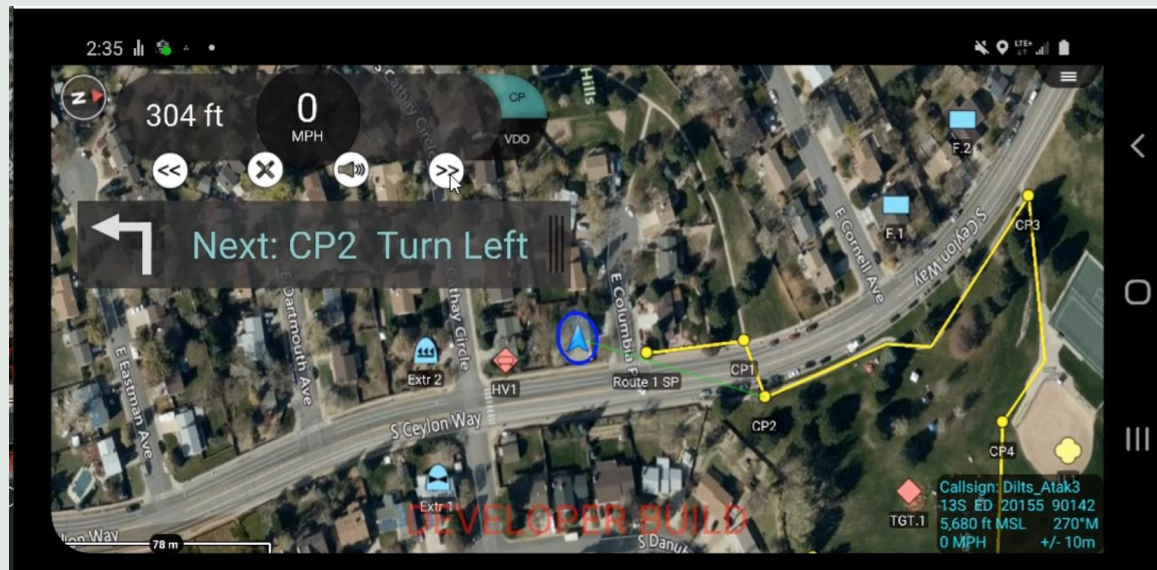
- Allow route progression in standalone mode

Live Map Sync Filtering

- Filter POI view has "Only Points Visible in Map View" checkbox
- Only items currently on map will be shown in the ATAK plugin



Routes



Newest Project: Health Score Algorithm

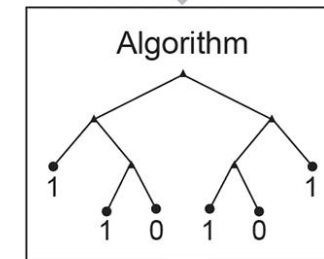
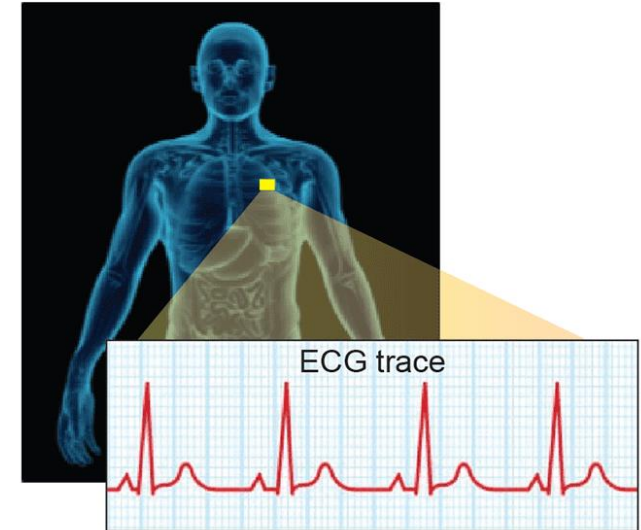
- Started this new project in mid- November
- Contracted through Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND)
- Massachusetts Institute of Technology (MIT) will be supplying our team with their patented health score algorithm, developed last year



Goals for JPEO-CBRND Project

- Analyze algorithm MIT gives us
- Optimize algorithm to work with restricted computing power (on garmin watch)
- Constantly read sensors on watch in order to collect data to feed into the algorithm
- Connect multiple watches to 1 EUD (Android) device in order to check health scores

Subject wears heart activity monitor



Result relayed to mobile device



Challenges I faced

- Scheduling (Standups, meetings, etc.)
- Learning new Garmin proprietary language (MonkeyC)
- Analyzing and understanding a large codebase

How SU helped me in my Internship

- COSC 117 – Java

70% of the work I did was in Java

- COSC 425 – Working with team

Working with other teammates I rely on to get my work done

- COSC 320 – Data Structures

Used queues, dictionaries, arrays, arraylists, etc.

What I learned

- Never be afraid to ask questions, no matter the circumstance
 - Exhaust every reliable option before asking for help
 - Use documentation and resources available to you
 - Step up to leadership positions
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