

Irrigators

Smart Watering System with Internet of Things



Sponsor Liason: Roberto Valenti

Project Advisor: Rafael Pozos

DAB Member: Kayla Larson

Team Members: Arvand Marandi, Caleb Lefcort,
Madison Spink, Matt Nguyen

Overview: This document serves as an introduction to the team, detailing each team member's educational history, work experience, skills, and extracurricular interests.

Arvand Marandi



EDUCATION

Bachelor of Science in Computer Science, Gonzaga University

August 2021 - May 2025

GPA: 3.61/4.00

Relevant Coursework: Bioinformatics, Computer Organization, Computer Security, Data Structures & Algorithms, Database Management, Data Science Algorithms, Design & Analysis of Computational Algorithms, Linear Algebra, Mobile App Development, Operating Systems, Senior Capstone, Software Development, Theory of Computation

SKILLS

Languages

Python, C++, C, Java, Javascript, SQL, Kotlin

Developer Tools

Git, Make, Figma, QGIS, Jupyter Notebook, Linux, UML

Libraries & Frameworks

React Native, Firebase, TensorFlow, LangChain, NumPy, Pandas

EXPERIENCE

GIS Research Assistant | *Python, QGIS, GDAL, OverpassQL, LangChain*

May 2024 - August 2024

University of Pittsburgh

Remote

- Finding an optimal routing algorithm for inaccessible locations, in which accessibility implies data availability.
- Developing variations of Tobler's hiking function and applying routing algorithms on the produced rasters.
- Constructed cost-rasters which were then converted to matrices using GDAL. Executed LCP algorithms to compute optimal paths, mapping geographic to pixel coordinates and converting paths back to raster format.

Machine Learning Intern | *Python, Jupyter, cuDNN, TensorFlow, Keras*

June 2023 - August 2023

Department of Defense

Seattle, WA

- Worked on a team of three to develop an image classification model for the U.S. Navy.
- Generated an extensive dataset of images, performing various data augmentation techniques using Roboflow to increase the model's performance metrics.
- Utilized NVIDIA's cuDNN library in conjunction with the Keras and TensorFlow libraries to develop and train multiple residual neural networks with a weighted average accuracy of 94%.

PROJECTS

Footy Creating a pickup soccer app with Javascript, React Native, and Firebase SDK. Administered an intuitive user experience, leveraging Figma for prototyping. Implemented an efficient data management system using Firestore DB for real-time sync and AsyncStorage for local caching. Scripted a tool using OverpassQL to fetch nearby fields.

OTHER INTERESTS

Soccer: Playing since the age of three. Supporter of the Seattle Sounders, Fulham, AC Milan, and the USMNT.

Anthropology: Google Earth is my favorite app. I love to learn about different peoples and cultures. Fun fact, my first and last names both describe locations.

Music: I started playing the piano in high school, later joining the school's jazz ensemble. Big fan of Steely Dan, Chick Corea, Jamiroquai, and Jermaine Cole.



Matthew Nguyen

EDUCATION

Gonzaga University

Aug. 2021 - May 2025

Bachelor of Science in Computer Science

Spokane, WA

GPA: 3.99/4.00

SKILLS

Languages: C, C++, Rust, Python, x86 Assembly, Haskell, Bash

Developer Tools: Git, Make, Docker, Jira, Confluence, Linux, Windows, GDB, WinDbg

EXPERIENCE

Software Engineer Intern

May 2024 – Aug. 2024

Microsoft

Redmond, WA

- Developed and presented a user mode hypervisor save/restore fuzzer built with LibFuzzer and C++
- Enhanced fuzzing efficacy through the research and implementation of structure-aware fuzzing techniques
- Identified and fixed two hypervisor bugs uncovered during the fuzzing process
- Provided key insights to the MORSE team, enabling them to continue their efforts in hypervisor fuzzing

Software Engineer Intern

July 2023 – Apr. 2024

Infineon Technologies

Portland, OR

- Enhanced ModusToolbox, a suite of tools providing a development environment for microcontroller devices
- Created a user-friendly feature enabling the writing and storage of comments during lookup table configuration
- Used Confluence for design documentation, where ideas were presented and refined with senior team members.

Topology Research Assistant

Jan. 2023 – May 2023

Gonzaga University

Spokane, WA

- Conducted Twitter data collection and analysis using Python libraries, including Pandas and NumPy
- Integrated optimizations, including automatic API account switching and a stochastic weighted selection algorithm
- Shared research findings and insights by presenting at the Spokane Intercollegiate Research Conference

Computer Science Lab Manager

Aug. 2021 – May 2022

Gonzaga University

Spokane, WA

- Wrote Bash scripts to streamline maintenance tasks and automate software installations on lab machines
- Assisted students in diagnosing and resolving technical issues, both software and hardware related
- Oversaw computer systems and maintained a clean lab environment in the Computer Science department

PROJECTS

Luna Jetson | Python, Jetson, Twilio, Flask, Ngrok

May 2023 – Present

<https://github.com/mootqns/luna-jetson>

- Created a real-time pet tracking system with Python, NVIDIA's Jetson Xavier AGX, and JetPack SDK
- Enabled smart notifications using Twilio for pet presence, preventing repeated alerts on pet detection
- Used Flask and Ngrok to serve and securely share static images to conform to Twilio's expectations

INTERESTS

Snowboarding: Enjoy park snowboarding and usually go up around 25 days per season

Tea: Passionate about quality loose-leaf tea and teaware from China, Taiwan, and Japan

Mindfulness: Focusing on practicing mindfulness through activities like meditation and kendama

Madison Spink



EDUCATION

Gonzaga University

Bachelor of Science in Computer Science

Spokane, WA

Aug. 2022 – May 2025

University of Washington

Undergraduate, B.A. in Political Science

Seattle, WA

Sept. 2019 – June. 2022

EXPERIENCE

SOFTWARE ENGINEERING INTERN

Microsoft

2020 – 2024

Seattle, WA

- Consecutive summer internships working on Microsoft Edge.
- Working on both front end and back- end development for Web Apps, and front end and back-end development for browser features.
- This includes AI integration, database management, and implementing HTTP and HTTPS APIs such as FETCH and REST APIs

SKILLS

C++, JavaScript, HTML, Python, Java

HTTP Request-Response APIs.

AI implementation into existing apps.

IOT development using Bluetooth.

- This was for the IoT elective at Gonzaga. The project was built using a Raspberry Pi.

Development of software for Windows and Linux.

INTERESTS

Graphics Programming: Currently focused on ray tracing.

Visual Arts : Portraiture, character design, concept art, and visual storytelling.

Agriculture: The development of sustainable local food systems, through both community initiatives and development of sustainable indoor farming techniques to supplement local food demand in cities.

Caleb Lefcort



EDUCATION

Gonzaga University

Bachelor of Science in Computer Science GPA: 3.88

Spokane, WA

Aug. 2021 – Present

EXPERIENCE

Data Engineering Intern

Numerica

June 2024 – Aug. 2024

Spokane, WA

- Worked in an Agile development environment building banking datasets using SQL

Teachers Assistant

Gonzaga University

Jan. 2024 – May 2024

Spokane, WA

- Graded assignments, quizzes, and tests, providing constructive feedback to students
- Provided office hours for students to ask questions and provide support on assignments

PROJECTS

Relational Database | *SQL, NodeJS, HTML, JavaScript*

- Built a relational database and web application for tracking NFL player stats using NodeJS and SQL

Card Game Application | *Java, Swing, Git*

- Built an application for the card game Onitama in Java using OOP principles in a team environment

Programming language Compiler | *Python*

- Built a simple programming language and compiler for that language

TECHNICAL SKILLS

Languages: Java, Python, C/C++, SQL (SQL server), JavaScript, HTML/CSS

Developer Tools: Git, VS Code, Visual Studio, Microsoft SQL Server Management Studio

Libraries: Pandas, NumPy, Matplotlib, Swing