Willem Mirkovich

Website: willemmirkovich.github.io

Email: willemmirkovich@gmail.com
Github: https://github.com/willemmirkovich

Education

- **University of Colorado Boulder, Engineering and Applied Science** — Boulder, CO
  Bachelor of Science - Computer Science; GPA: 3.9 — 2018 - May 2020
  Courses: Algorithms, Artificial Intelligence, Machine Learning, Data Science, Big Data, Operating Systems
- **University of Washington Seattle, Pre-Engineering** — Seattle, WA
  Pre-Engineering - Computer Science; GPA: 3.7 — 2016 - June 2018
  Courses: Data Structures, Databases, Applied Linear Algebra, Differential Equations

Honors and Awards

- Graduated **Magna Cum Laude** from University of Colorado Boulder - May 2020
- **Dean's List** University of Colorado Boulder - 2018 to 2020
- **Engineering Transfer Scholarship** while transferring to CU Boulder - 2018
- **Dean's List** attending University of Washington Seattle - 2016 to 2018

Professional Work Experience

- **Software Engineer** — Full-time
  Cape Analytics, Remote — Feb 2022 - Current
  - **Geospatial Imagery Analysis**: Integrated and evaluated many geospatial imagery providers into Cape's inference infrastructure
  - **Machine Learning Model Integration**: Coordinated with Machine Learning Engineers to bring inference models into production, optimizing for latency, reproducibility and modularity
  - **Rewrote Core Service**: Rewrote core image rendering service that was failing and outdated. Tested to ensure outputs were unchanged, while upgrading packages utilized as well as increasing robustness
- **Professional Research Assistant** — Part-time
  University of Colorado Boulder, Aerospace Engineering — Jul 2020 - Current
  - **Neural Network Development**: Developed Spatiotemporal prediction models using Neural Networks
  - **AMGeO Python API**: Designed and developed API for generating and loading assimilative maps of geospace data
  - **Microservice Architecture**: Created new microservice for data retrieval from AMPERE, along with logging tools for quick error debugging and anonymous user data retrieval
  - **Docker/Python 3 upgrade**: Updated core web services to utilize docker containers, as well as upgraded code base from Python 2 to 3
- **Full Stack Software Engineer I/II/III** — Full-time
  Anark Corporation, Boulder CO — Jun 2020 - Jan 2022
  - **Built API**: Built API for front-end visualization tools accessing/viewing 3D data and models
  - **Docker Microservices**: Built microservices within Docker containers
  - **Updated Legacy Code**: Modernized TypeScript code base to be built within NPM project instead of in Visual Studio
- **Software Engineer Intern** — Part-time
  Anark Corporation, Boulder CO — Nov 2018 - May 2020

Student Work Experience

- **Undergraduate Research Assistant/Developer** — Part-time
  University of Colorado Boulder, Aerospace Engineering — Aug 2019 - May 2020
  - **Machine Learning Development**: Began work on spatiotemporal prediction using assimilative maps from AMGeO
  - **Enabled Security on AMGeO Website**: Used JSON Web Tokens to authenticate users on main website
- **Teaching Assistant, Discrete Structures Math Course** — Part-time
  University of Colorado Boulder, Engineering and Applied Science — Jan 2019 - Dec 2019
  - **Led Work Group**: Developed worksheets for students to complete outside of class, go over topics in greater detail
  - **Held Office Hours**: Assisted students with classwork, prepared students for exams
  - **Grading**: Graded midterm and final exams
- **Research Assistant** — Part-time
  University of Washington Seattle, Foster School of Business — Feb 2018 - Aug 2018

Publications

1. Willem Mirkovich, Tomoko Matsuo, Liam Kilcommons. (2022). AMGeO 2.0: Crafting an API for Geospace Data Scientists (ec2022v2). Zenodo. https://doi.org/10.5281/zenodo.6780968

Presentations

- **AMGeO 2.0: Crafting an API for Geospace Data Scientists**
  Earthcube 2022, San Diego CA — Jun 2022
  Presented my publication at Earthcube 2022 gathering
  - Collection of presentations/publications: https://zenodo.org/record/6792049
  - Github repository containing my work: https://github.com/earthcube2022/ec22_mirkovich_etal
- **Predictive Models of Ionospheric Convection Patterns During Substorms Related to STEVE**
  AGU 2021, Remote — Dec 2021
  My AGU 2021 presentation materials: https://github.com/willemmirkovich/AGU-2021
- **Data-Driven Modeling of Polar Ionospheric Electrodynamics Using Convolutional [cont.]**
  AGU 2020, Remote — Dec 2020
  [cont.] Neural Networks
  My AGU 2020 Poster: https://agu2020fallmeeting-agu.ipostersessions.com/Default.aspx?s=F7-22-9F-31-68-48-3B-97-09-C7-96-B3-96-D3-58-31#stay

Workshops

- **AMGeO Workshop 2022**: Led workshop hosted by AMGeO in coordination with Earthcube to teach/expose AMGeO and its collaborators to new tools and methods used by the community
  - Workshop teaching materials: https://amgeo-collaboration.github.io/Earthcube-Workshop-2022-Intro/
  - Workshop materials: https://github.com/AMGeO-Collaboration/Earthcube-Workshop-2022
- **CEDAR Workshop 2021**: Led workshop going over new AMGeO API, hosted on AWS, using Jupyter Notebooks during CEDAR 2021 conference
  - Workshop link: https://cedarscience.org/workshop/2021-workshop-amgeo
  - Workshop materials: https://github.com/AMGeO-Collaboration/CEDAR-Workshop-2021

Projects

- **AMGeO**: AMGeO is a data science software project funded by the NSF EarthCube program aiming to open up the vast amount of geospace data to a broader audience. I have been a maintainer of the core AMGeO client tool that generates assimilative maps in conjunction with their web applications/services that package 3rd party data. AMGeO website: https://amgeo.colorado.edu/
- **Senior Thesis**: Completed a Senior Thesis Capstone. Research focused on work in pruning the search space of repeated iterations concerning slight variations of the same problem to reduce computation time. Applications in Linear Programming, String Search and Shortest-Path Algorithms.
- **Designing for Defense**: Technical Lead and Main Presenter in team of undergraduate/graduate students to find solution to problem posed by US Air Force Special Forces using Lean Launchpad methodology. Designed application to evaluate candidate stress. Presented final pitch to group of DOD affiliates and members numbering around 300 people.

Volunteering

- **Work Study Mentor** — Remote
  Cristo Rey San José Jesuit High School — Aug 2022 - Current
  Mentor a high school sophomore in a work study program through her high school. Teach programming lessons one to two times per week, in addition to helping to develop soft skills such as typing, planning and time management.

Skills Summary

- **Languages**: Python, TypeScript, BASH, LaTeX, SQL, Java
- **Frameworks/Packages**: Scikit, numpy, TensorFlow, Webpack, Flask, NodeJS, Express, Jest, JSON Web Tokens
- **Tools**: Docker, GIT, JupyterNotebook, JupyterLab, MongoDB, Neovim, AWS, PostGIS, QGIS