

Cole McCall

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SKILLS

Programming: Python (Pandas, Scikit-Learn, RasterIO, GDAL, ArcPy, etc), C++ (OpenCV), C#, SQL
Tools: ArcGIS Pro, Microsoft SQL Server, PowerBI, SSIS, Microsoft Office

EDUCATION

Northwest Nazarene University

Aug 2019 - May 2023

Bachelor of Science, Computer Science (GPA: 3.75/4.00)
Concentrations in Data Science and Cybersecurity

EXPERIENCE

Student Researcher

March 2021 - September 2021

Northwest Nazarene University

- Worked on a team of 4 researchers to develop machine learning tools in C++, Python, and ArcGIS Pro that map wildland forest fires from drone imagery, resolving issues in previous methods and developing new approaches.
- Trained and implemented a Support Vector Machine (SVM) to map burn extent on 4 fires with 77% accuracy.
- Created software that leverages deep learning to improve the accuracy of the burn extent map from 59% to 87%.

Software Test Engineer

September 2021 – Present

Northwest Nazarene University

- Performed tests on student and university software to ensure it works correctly, while detecting bugs and errors.
- Worked with developers to make necessary improvements and changes.

Teaching Assistant

September 2021 - Present

Northwest Nazarene University

- I collaborate with and mentor fellow students, while grading and teaching CS courses such as Data Structures, C++ Programming, Database Design/Programming (x2), Computer Architecture (x2), and Spatial Analysis (x2).

Research Support

May 2022 - September 2022

Frontier Development Lab

- Worked on a team with 6 professors, Ph.D. students, and postdocs from around the world to develop machine learning tools that prevent fires from starting and new fires from growing into large mega-fires.
- Created python scripts that automate/speed-up the data acquisition and processing phases.
- Planned and developed a system to map wildfires using unsupervised change detection with contrastive learning.

Lead Research Assistant

September 2022 - Present

Northwest Nazarene University

- Led semester project groups in the Spatial Analysis course, which continuing NNU's Fire Monitoring and Assessment Platform (FireMAP) research, by applying Artificial Intelligence and Machine Learning on remote sensing datasets.
- Developed software in Python and tools in ArcGIS Pro to map wildfires from satellite imagery with 94% accuracy.

PUBLICATIONS

Hamilton, D.; Brothers, K.; McCall, C.; Gautier, B.; Shea, T. (2021). *Mapping Forest Burn Extent from Hyperspatial Imagery Using Machine Learning*. Remote Sens. 13, 3843. <https://doi.org/10.3390/rs13193843>

Zhang, B., Wang, H., Alabri, A., Bot, K., McCall, C., Hamilton, D., & Růžička, V. (2022). *Unsupervised wildfire change detection based on Contrastive Learning*. AI + HADR 2022 Accepted Papers. <https://arxiv.org/abs/2211.14654>

CONFERENCES

- Student Assistant at the 2023 ESRI Developer Summit
- Presented at the Fall 2021 Tactical Fire Remote Sensing Advisory Committee (TFRSAC)
- Presented at the Fall 2022 Tactical Fire Remote Sensing Advisory Committee (TFRSAC)