Andrew J. Mikalsen

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ajmikals

Research Interests

My research is on software systems for data-intensive computing in resource constrained environments. I am drawn to problems that have strong algorithmic components, with a particular interest in applied algorithms and data structures. I tend to focus on problems with applications to scientific computing, especially computational biology. Broadly speaking, my research goals are to (i) develop the theoretical tools needed by system designers and (ii) apply these tools by implementing full-scale systems for scientific applications. My current focus is on edge computing for real-time DNA analytics.

Education

Aug. 2021 – May 2027 **Doctor of Philosophy, Computer Science and Engineering**,
University at Buffalo, the State University of New York, GPA 4.0
Advised by Dr. Jaroslaw 'Jaric' Zola

Jan. 2020 – May 2021 **Bachelor of Science, Computer Science**,
University at Buffalo, the State University of New York, GPA 3.96

Professional Experience

May 2021 – Present **Research Assistant in Scalable Computing Research Group (SCoRe)**,
University at Buffalo, Amherst, NY
Alternating research and teaching appointments

Aug. 2024 – Present **Teaching Assistant for Operating Systems (CSE 421/521)**,
University at Buffalo, Amherst, NY
Alternating research and teaching appointments

Sep. 2020 – May 2021 **Research Aide in Scalable Computing Research Group (SCoRe)**,
University at Buffalo, Amherst, NY

Aug. 2020 – Dec. 2020 **Undergraduate Teaching Assistant for Data Structures (CSE 250)**,
University at Buffalo, Amherst, NY

May 2020 – Aug. 2020 **Research Intern (NSF REU) in Scalable Computing Research Group (SCoRe)**,
University at Buffalo, Amherst, NY

Skills

Languages: C++, C, Rust, Go, Python, Shell

Development Tools: Git, CMake, Vim, Neovim, VS Code, Jupyter, Docker, GNU

Operating Systems: Linux, Unix, macOS

Technical Knowledge: Parallel Computing, Distributed Systems, Internet of Things, Big Data, Edge Computing, Operating Systems, Algorithms, Data Structures, Databases, Bioinformatics, Machine Learning

Honors and Awards

Dec. 2025 CSE PhD Poster Competition (First Place)
University at Buffalo

Dec. 2022 Russell L. Agrusa CSE Student Innovation Competition (Second Place)
University at Buffalo

Dec. 2022 CSE PhD Poster Competition (First Place)
University at Buffalo

Aug. 2021 Presidential Fellowship
University at Buffalo

Publications and Presentations

Published Papers

A.J. Mikalsen and J. Zola. "Coriolis: Enabling Metagenomic Classification on Lightweight Mobile Devices". In: *Intelligent Systems for Molecular Biology (ISMB)*. 2023, pp. i66–i75

Poster Presentations

A.J. Mikalsen and J. Zola. "Searching DNA Databases on Mobile Devices (Poster)". In: *Ontario Database Day (OnDBD)*. 2025

Undergraduate Mentoring

Kamil Woskowiak, University at Buffalo, 2025 – Present

Professional Service and Activities

External Reviewer

International Parallel and Distributed Processing Symposium (IPDPS), 2024

International Conference on Parallel Computing (ICPP), 2023

Professional Societies Membership

Association for Computer Machinery (ACM), Student Member, 2018 – Present

Featured Software

Draupnir: Datalog engine for large-scale program analysis on commodity hardware
`https://git.odin.cse.buffalo.edu/Norn/Draupnir`

ALCaMI: C++ framework for efficient concurrent caching using user-defined policies
`https://gitlab.com/SCoRe-Group/alcami`

DNAsbt: C++ library for fast substring matching against on-disk genome databases
`https://gitlab.com/SCoRe-Group/dnasbt`

SMARTEn: Programming model and C++ framework for mobile DNA analytics
`https://cse.buffalo.edu/~jzola/smarten/`