Micah Elliot Halter

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Education

Jan 2020 – May 2022
Master of Science in Computer Science
Georgia Institute of Technology, Atlanta, GA.
- Specialization in **Machine Learning**, 4.0 GPA

Aug 2015 – May 2019
Bachelor of Science in Computer Science
Georgia Institute of Technology, Atlanta, GA.
- Concentration in **System Architecture** and **Theory**
- Dean's List Fall 2015, Spring 2016, Fall 2016, Fall 2018, Spring 2019

Professional Experience

Jan 2023 – Present
University of Florida – Research Programmer
Remote (Englewood, NJ).
- Researched **Applied Category Theory** based scientific modeling in **Julia** for rigorously defining **metamodeling** tasks in a way to automate scientific modeling procedures.
- **Advised** graduate students and researchers on **software development practices** to be able to develop code that is easier to share and maintain.

Feb 2021 – Dec 2022
Balena – Backend Engineer
Remote (Englewood, NJ).
- Led the development of rigorous **security-related policies** in pursuit of **ISO 27001** and **SOC 2** certifications
- Developed internal tooling in **POSIX Shell**, **Python**, and **TypeScript** for automated security testing
- **Supported customers** directly through support tickets and calls
- Developed **backend API** code in primarily **TypeScript** and **JavaScript**

Jun 2019 – Feb 2021
Georgia Tech Research Institute – Research Scientist
Atlanta, GA.
- Developed **Applied Category Theory** based scientific modeling ecosystem in **Julia** for representing scientific scientific theories, hypotheses, and experiments as runnable code
- Led the hardening of an HPC cluster with DISA **STIGs** for a secure environment using **Ansible** and **Shell Scripting**
- Developed AI models using **PyTorch** and **TensorFlow** to identify compromised machines on a network using **NetFlow** data
- Contributed and participated in white paper and **proposal writing** to bring in more funding for new and on-going projects

Jan 2016 – May 2019
Georgia Tech Research Institute – Undergraduate Research Assistant
Atlanta, GA.
- Developed **PostGIS**-backed web application with **Golang** backend, **PostgreSQL** database, and APIs for facilitating collaboration among undersea sonar research community. Deployed using **Docker** and **Nginx**
- Developed **machine learning** models in **Python** for predicting crimes in Portland, OR using temporal and geographic features derived from crime statistics and GIS data

May 2016 – Aug 2017
The Boeing Company – Software Development Intern
Kent, WA.
- Developed a security auditing tool suite for Red Hat Enterprise Linux 7 to maintain hardened security on classified servers
- Developed a web application in C#, HTML, and JavaScript to view and analyze network traffic
- Developed several system administration scripts as needed by team members to complete tasks such as emailing system logs and automatic server backups
- Organized and led a software development team to create a minimum viable product of a Kanban board web application
- Pitched the Kanban board prototype to management to form a team to continue development of the application after I left
- Documented and executed an upgrade plan for the company's identity management servers
- Developed an Outlook-integrated conference room mapping tool in C#

May 2016 – Aug 2016
– Software Development Intern
North Charleston, SC.
- Organized and led a software development team of five in a three day coding sprint to create a minimum viable product of a Kanban board web application
- Pitched the Kanban board prototype to management to form a team to continue development of the application after I left
- Documented and executed an upgrade plan for the company's identity management servers
- Developed an Outlook-integrated conference room mapping tool in C#

Projects

AstroNvim
Software Development.
- Lead development for a powerful Neovim configuration ecosystem in **Lua**
- Maintain and write accurate **documentation** for users to be able to configure, extend, and contribute to the project
- Develop the **open source community** with >9k stars on GitHub and >5k active visitors per week on the documentation pages

Academic Contributions

Funding

2023 – 2023 Task Lead, DARPA, *Automating Scientific Knowledge Extraction and Modeling*, ≈$1M
2020 – 2021 Task Lead, DARPA, *Computable Models - Generalized Algebraic Theories for Enhancing Multiphysics*, ≈$1.35M
2018 – 2021 Task Lead, DARPA, *Artifical Intelligence Exploration - Automating Scientific Knowledge Extraction*, ≈$1M
2019 – 2021 Performer, Office of Naval Research, *Extracting, Explaining, and Estimating Information in Sonar Data*, ≈$400K
2019 – 2021 Performer, Office of Naval Research, *MCM Situational Awarness*, ≈$375K
2018 – 2019 Performer, Air Force, *Network Risk Indication*, ≈$135K
2016 – 2019 Performer, Office of Naval Research, *Performance Estimation of Underwater MCM Operations*, ≈$990K
2015 – 2019 Performer, Office of Naval Research, *Automation for UxV-based Mine Countermeasures*, $540K

Peer Reviewed Journal Publications

- *An algebraic framework for structured epidemic modelling*, Sophie Libkind, Andrew Baas, **Micah Halter**, Evan Patterson James P. Fairbanks, Philosophical Transactions of the Royal Society A (Volume 380, Issue 2233), 2022

Peer Reviewed Conference Publications

- *Typed and Stratified Models with Slice Categories*, Sophie Libkind, Andrew Baas, **Micah Halter**, Evan Patterson James P. Fairbanks, Applied Category Theory, 2022
- *Compositional Scientific Computing with Catlab and SemanticModels*, **Micah Halter**, Evan Patterson, Andrew Baas, James Fairbanks, Applied Category Theory, 2020
- *SemanticModels.jl: A Julia Package for Scientific Model Augmentation*, **Micah Halter**, Sreenath Raparti, Kun Cao, Christine Herlihy, James Fairbanks, JuliaCon, 2019
- *A Compositional Framework for Scientific Model Augmentation*, **Micah Halter**, Christine Herlihy, James Fairbanks, Applied Category Theory, 2019

Invited Talks

- *Compositional Epidemiological Modeling Using Structured Cospans*, **Micah Halter** and Evan Patterson, University of California Riverside Categories Seminar, Nov 2020

Posters

- *SemanticModels.jl: A Framework for Automatic Composition of Scientific Models Across Domains*, **Micah Halter**, Kun Cao, James Fairbanks, SIAM Conference on Parallel Processing for Scientific Computing, Feb 2020
- *Scientific Knowledge Extraction, Augmentation & Analysis*, **Micah Halter**, James Fairbanks, Eric Davis, Clayton Morrison, Ryan Wright, DARPA Demo Day, Sep 2019

Open Source Involvement

Core Maintainer

- **AstroNvim** – https://github.com/AstroNvim/AstroNvim
- **AlgebraicJulia** – https://github.com/AlgebraicJulia
- **TikzCDs.jl** – https://github.com/JuliaTeX/TikzCDs.jl

Contributor

- **Neovim** – https://github.com/neovim/neovim
- **JuliaTeX** – https://github.com/JuliaTeX
- **Beanconqueror** – https://github.com/graphefruit/Beanconqueror
- **sir-julia** – https://github.com/epirecipes/sir-julia
- **qutebrowser** – https://github.com/qutebrowser/qutebrowser

Languages & Skills

Full-Stack Development • Deep Learning • System Administration • Database Design and Management
High Performance Computing • Machine Learning • Data Science • Functional Programming • Category Theory
Julia, Python, Go, Typescript, JavaScript, Bash, C/C++, Java, Haskell, Scala, SQL, MySQL, PostgreSQL, LaTeX, HTML, CSS