Dominic Kennedy

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Education

University of Utah — Salt Lake City, UT
Ph.D. Student in Computer Science

University of Tennessee — Knoxville, TN
Bachelor of Science in Computer Science; summa cum laude — *Graduation 2023*

Publications

1. Dominic Kennedy, Paula Olaya, Jay Lofstead, Rodrigo Vargas, and Michela Taufer. Augmenting singularity to generate fine-grained workflows, record trails, and data provenance. In *2022 IEEE 18th International Conference on e-Science (e-Science)*, pages 403–404, 2022

2. Paula Olaya, Dominic Kennedy, Ricardo Llamas, Leobardo Valera, Rodrigo Vargas, Jay Lofstead, and Michela Taufer. Building trust in earth science findings through data traceability and results explainability. *IEEE Transactions on Parallel and Distributed Systems*, 34(2):704–717, 2023

3. Guojing Cong, Shruti Kulkarni, Seung–Hwan Lim, Prasanna Date, Shay Snyder, Maryam Parsa, Dominic Kennedy, and Catherine Schuman. Hyperparameter optimization and feature inclusion in graph neural networks for spiking implementation. In *2023 International Conference on Machine Learning and Applications (ICMLA)*, pages 1541–1546, 2023

Experience

ABS Consulting — Knoxville, TN
Software Developer — *May 2023 – July 2024*

- Developed custom ML model for matching blueprints to information tables in technical report PDFs, based on statistical inference, OCR, and fuzzy keyword matching
- Built custom ML model for classifying text relevancy based on NLP keyword metrics
- Developed workflow to extract hierarchical data from PDFs using multiple heuristics then storing in SQL

TENNLab — Knoxville, TN
Undergraduate Researcher — *Jan. 2023 – May 2023*

- Spearheaded new approach to visualize spiking networks, step by step, in browser
- Further developed browser based application for hand programming spiking networks

Global Computing Lab — Knoxville, TN
Undergraduate Researcher — *Aug. 2021 – Nov. 2022*

- Extended containerization system (Apptainer) to collect workflow metadata within HPC workflows
- Ran performance analysis for parallel scientific workflows on HPC; determining containerization overhead
- Created a system for reproducing computational scientific results by containerization and metadata collection
- Involved with the integration of HPC hierarchical schedulers into Kubernetes clusters

Cisco Systems — Knoxville, TN
Security Research Engineer Summer Intern — *Summer 2021; Summer 2022*

- Tested for program correctness and located software defects using static analysis tools
- Found active vulnerabilities by dynamically analyzing production code using run-time analysis tools such as Valgrind and GDB, while fuzzing
- Wrote bug reports following a found vulnerability; provided remediation steps to product owners

Projects

Contributed to the Futhark Programming Language

- Wrote a fix, preventing the Futhark interpreter from crashing with malformed array input
- Added a feature for variable formatting in the Futhark REPL

In-Memory FS: Wrote a Go library for an in-memory filesystem, lowering I/O latency by up to 125%

Cellular Automata: Implemented web based animated cellular automata using Rust, WASM, and WebGL

TN Soccer Reports: Conceived of and created system for soccer incident tracking

- Backend written in Golang and deployed on AWS
- Uses Firebase API to send emails and update database
- Automatically creates PDF reports and sends them to pertinent parties
- In use by *Tennessee State Soccer Assoniation* since 2021 with >99.9% SLA; has tracked >4,750 incidents to date

Technical Skills

C, Python, C++, Haskell, Rust, TypeScript, Git, Docker, Linux