Curriculum Vitae
Ian Glen Neal

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Education

The University of Michigan **September 2018 — Current**

Ph.D. in **Computer Science** (Pre-candidate), advised by **Dr. Baris Kasikci**

The University of Texas at Austin **Graduated May 2018**

B.S. in **Computer Science**
B.S. in **Electrical Engineering**, **Minor** in **Biblical Hebrew**

Research Interests

Operating Systems, Storage Systems, Computer Architecture, Security and Secure Systems, Virtualization

Publications

Ofir Weisse, **Ian Neal**, Kevin Loughlin, Thomas Wenisch, Baris Kasikci. "NDA: Preventing Speculative Execution Attacks at Their Source." 52nd IEEE/ACM International Symposium on Microarchitecture (MICRO 2019). To be published October 2019.

Yige Hu, Zhiting Zhu, **Ian Neal**, Youngjin Kwon, Tianyu Cheng, Vijay Chidambaram, and Emmett Witchel. "TxFS: Aggressive Optimizations Using File System Transactions." 2018 USENIX Annual Technical Conference (USENIX ATC '18). June 2018. **Awarded Best Paper**

Ian Neal. "The Advantages of a Transactional Interface: Porting Applications to TxFS." B.S. Honors Thesis, Department of Computer Science, The University of Texas at Austin, May 2017.

Patents

Video Frame Brightness Filter *(patent pending)* Attorney Docket Number 405417-US-NP

User-Specific Video Frame Brightness Filter *(patent pending)* Attorney Docket Number 405419-US-NP

Color-Specific Video Frame Brightness Filter *(patent pending)* Attorney Docket Number 405420-US-NP

Current Research and Projects

Lapidary: Creating beautiful gem4 simulations **Released July 2019**

Source available at: https://github.com/efeslab/lapidary

- Used in the evaluation of NDA
- Creates gem5 checkpoints on bare-metal to avoid the weeks of simulation required to create viable checkpoints
- Takes core dumps of the program through gdb and transforming the output into a gem5-compatible checkpoint
- Performs short simulations over many checkpoints in accordance with the SMARTS sampling methodology

Speculative Execution—Boon or Bane? **September 2017 — Current**

- File-system research project under **Dr. Thomas Wenish** and **Dr. Baris Kasikci** in collaboration with students **Ofir Weisse** and **Kevin Loughlin**
- Rather than trying to patch individual speculative execution channels or bugs, we are instead re-evaluating the assumptions made in the design of speculative processors and what can be done to ensure they operate safely, rather than hoping they do

File Systems in Non-volatile Main Memory **September 2017 — Current**

- File-system research project under **Dr. Baris Kasikci** in collaboration with **Dr. Youngjin Kwon** and **Dr. Simon Peter**, working with student **Gefei Zuo**
- Investigating the software and data structure design changes that need to occur for NVM that challenge the assumptions about storage devices made in previous file-system designs

Honors and Awards

Richard H. Orenstein Fellowship in Memory of Murray Orenstein	**2018 — 2019**
National Science Foundation (NSF) Research Experiences for Undergraduates (REU) Grant	**2018**
Computing Research Association's Outstanding Undergraduate Researcher Award – Honorable Mention	**2017**
Dusty and Doris Duesterhoeft Endowed Presidential Scholarship	**2017**
Leola W. and Charles H. Hugg Trust Scholarship	**2013 — 2016**
College of Natural Sciences Book Award for Academic Excellence	**2016**
Boyce Family Scholarship	**2016**
Carl R. Trull Endowed Presidential Scholarship	**2015**
Edward Morgan and Rebecca Brown Case Endowed Presidential Scholarship	**2014**

Teaching Experience

Scientific Inquiry Across Disciplines **Fall 2014, Fall 2015, Fall 2016, Fall 2017**

- Guided students as they came up with inquiries and potential experiments to perform
- Advised students on how to design experiments and perform statistical analyses on collected data
- Aided and supervised students in a biology lab while students performed experiments

Industry Experience

Software Engineering Intern, Microsoft **Summer 2018**

- Created real-time video processing module to automatically adjust brightness for low-vision users
- Led invention of novel techniques for smooth brightness adjustment

Software Engineering Intern, Microsoft **Summer 2017**

- Designed C# web client library and PowerShell Cmdlet for Exchange data acquisition
- Improved existing REST service by adding features and eliminating defects

Software Engineering Intern, Google **Summer 2016**

- Designed new modular optimization for Flume C++ backend to remove redundant operations
- Implemented optimization tasks that could be run at any time and still maintain graph invariants

Software Engineering Intern, Tableau Software **Summer 2015**

- Created Puppet manifests to deploy product code and support software
- Created extensive validation tests and automated current infrastructure

Software Engineering Intern, Tableau Software **Summer 2014**

- Created ETL scripts to recover and transform product usage data for internal analysis
- Repaired and maintained existing data set for use by marketing and quality assurance teams

Professional Activities

Administrator — Systems Reading Group **September 2018 — Current**

- Facilitate discussions over peer-reviewed publications or upcoming submissions in a weekly meeting
- Organize presentation schedules and logistics for the meetings with fellow graduate students