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**, with **Special Honors** (Turing Scholars Honors Program)
  B.S. in **Electrical Engineering**, with a **Minor** in **Biblical Hebrew**

Research Interests

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

Publications

Ian Neal, Gefei Zuo, Eric Shiple, Youngjin Kwon, Simon Peter, Baris Kasikci. "A Systematic Analysis of NVM File-Indexing Structures." Fifteenth EuroSys Conference 2020 (EuroSys '20). **In submission.**

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 '52). 2019.

Yige Hu, Zhiting Zhu, **Ian Neal**, Youngjin Kwon, Tianyu Cheng, Vijay Chidambaram, and Emmett Witchel. "TxFS: Leveraging File-System Crash Consistency to Provide ACID Transactions." 2018 USENIX Annual Technical Conference (USENIX ATC '18). 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, 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 gem5 simulations   **Released July 2019**

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

- 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
- Used in the evaluation of NDA

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

- Computer architecture and security research 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