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**

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.

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

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

- File-system research project under **Dr. Baris Kasikci**, **Dr. Youngjin Kwon**, and **Dr. Simon Peter**
- 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

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 blocking individual speculative execution attacks, we instead re-evaluate the assumptions made in the design of processor speculation mechanisms

Selected 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

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