Derrick Greenspan
PhD Candidate, Computer Science

https://derrickgreenspan.github.io/
derrick.greenspan@ucf.edu

Education

- **Doctor of Philosophy in Computer Science** - University of Central Florida - Expected Graduation Date: *May 2024*

    - **Advisor:** Dr. Mark Heinrich; **Co-advisor:** Dr. Yan Solihin.
    - **Focus:** The crash consistency, performance, and security of Persistent Memory Objects.

- **Master of Science in Computer Science** - University of Central Florida - *May 2019*

    - **Focus:** Compiler support for hybrid persistent memory systems.

- **Bachelor of Science in Computer Science** - University of Central Florida - *December 2016*

Publications

- Greenspan, Derrick, et. al. 'LOaPP: Improving the performance of Persistent Memory Objects via <u>L</u>ow-<u>O</u>verhead <u>at</u>-rest <u>P</u>MO <u>P</u>rotection', To appear in the *Proceedings of the IEEE International Symposium on Secure and Private Execution Environment Design.* 2024.

- Greenspan, Derrick, et. al. 'Improving the Security and Programmability of Persistent Memory Objects.' *Proceedings of the IEEE International Symposium on Secure and Private Execution Environment Design.* 2022. (`http://doi.org/10.1109/SEED55351.2022.00021`)

- Greenspan, Derrick. 'LLAMA-automatic memory allocations: an LLVM pass and library for automatically determining memory allocations.' *Proceedings of the International Symposium on Memory Systems.* 2019. (`https://doi.org/10.1145/3357526.3357534`)

Tests

- **GRE (Summer 2016):** *Total: 321, Verbal: 163, Math: 158*

Experience

- **Graduate Research Assistant**: University of Central Florida, ARPERS (Architecture Research for PErformance, Reliability, and Security)

    November 2020 - Present Day: Graduate Research Assistant

    - Graduate research on Persistent Memory Objects (PMOs), funded through an Office of Naval Research (ONR) grant.
    - Designed, implemented, and evaluated the performance and security of PMOs with different encryption schemes by modifying the Linux kernel.
    - ARPERS lab is supervised under the direction of Dr. Yan Solihin (CS PhD, University of Illinois 2002).
    - This project is also co-advised under Dr. Mark Heinrich (EE PhD, Stanford University 1999), with assistance from Dr. Naveed Ul Mustafa (CpE PhD, Bilkent University 2019)
    - Sponsored and supervised four undergraduate senior design members from January-July, 2023; successfully assisting them in porting programs to use PMOs.

- **Research Assistant**: University of Central Florida: Institute for Simulation and Training (IST): Advanced Research Computing Center (ARCC)

    January 2017 - October 2020: Graduate Research Assistant

    May 2016 - December 2016: Undergraduate Research Assistant

- Responsible for providing consulting and technical services to help users of ARCC resources, including helping orient new users to the system, helping users resolve queuing and submission errors, and helping with application and library builds to support software on the system.
- The ARCC houses high performance computing (HPC) resources for use in research by faculty (and their students) across the University of Central Florida.
- Was directed by Dr. Paul Wiegand (CS PhD, George Mason University 2004) and Dr. Glenn Martin (M&S PhD, University of Central Florida 2012).

- **Technical Support for TeachLivE**: University of Central Florida: Synthetic Reality Laboratory (SREAL) and the College of Education and Human Performance

  August 2012 - May 2016

  - Provided technical support for a virtual classroom environment for aspiring teachers.
  - TeachLiVE later became the basis of the Mursion Virtual Reality Training Simulation Software platform, a virtual reality environment designed to allow professionals to train and master complex interpersonal skills.
  - Mentored by Dr. Charles Hughes (CS PhD, Pennsylvania State University 1970), Dr. Lisa Dieker (Ed PhD, University of Illinois 1994), Dr. Kate Ingraham (Ed PhD, University of Central Florida 2014), and Dr. Aleshia Hayes (M&S PhD, University of Central Florida 2015).

Research Interests

- **General**: *Operating Systems and their Design, Computer Architecture, Memory Hierarchies, Theory of Computation*

- **Specific**: *Hybrid Memory Systems, DRAM Memory Alternatives, Non-Volatile Memory Systems, Linux, Low-Level Hardware/Software Interface*

Selected Coursework

- **Advanced Computer Architecture** (CDA 5106) *Spring 2017 – Modern processor design, instruction-level parallelism, thread-level parallelism, data-level parallelism, memory hierarchy, and I/O.* Grade Received: **A**

- **Multicore Programming** (COP 6616) *Fall 2017 – Computational principles, algorithms, and tools for multi-processor programming. Programming models and frameworks, lock-free synchronization, transactional memory.* Grade Received: **A**

- **Special Topics - Advanced Memory Systems** (EEL 5937) *Fall 2018 – Studies of State of the Art Advanced Memory Systems. Memistors, Non-Volatile Memory, Spin-Transfer Torque (STT) Memory, Chip Stacking.* Grade Received: **A**

- **Operating Systems Design Principles** (COP 5611) *Spring 2019 – Structure and functions of operating systems, process communication techniques, high-level concurrent programming, virtual memory systems, elementary queuing theory, security, distributed systems, case studies.* Grade Received: **A**

- **Emerging Device Computer Architectures** (EEL 6361) *Spring 2020 – Post-CMOS logic devices. Spintronic logic and memory systems. Memristor-based processing elements. Logic-In-Memory and non-Boolean computing approaches. System design and performance assessment, and applications.* Grade Received: **A**

- **Parallel Computer Architecture** (CDA 6107) *Fall 2020 – Principles and trade-offs in the design of parallel architectures, shared-memory, message-passing, dataflow, data-parallel machines, cache coherence protocols, and consistence models.* Grade Received: **A**