Benjamin D. Killeen

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Education

- **Johns Hopkins University** — Baltimore, MD
  Ph.D. in Computer Vision and Robotics — *Expected: May 2024*
- **University of Chicago** — Chicago, IL
  Bachelors in Computer Science — *June 2019*
  Minor in Physics — *GPA: 3.806*

Experience

- **University of Chicago** — Chicago, IL
  Instructional Assistant — *January 2019 - June 2019*
  - **Teaching Assistant**: Instructs students in practical machine learning methods using Python during regular office hours. Assists with grading, class organization, and responding to student questions.
  - **Grader**: Provided constructive feedback and quantitative grades for Scientific Visualization course. Responded to student questions via Piazza.
- **Epic Systems** — Madison, WI
  Software Development Intern — *June 2018 - August 2018*
  - **Predictive Modeling**: Developed custom machine learning functionality to SlicerDicer, a web-based tool enabling clinicians to investigate health data.
- **IBM Research - Almaden** — San Jose, CA
  Research Intern — *June 2017 - September 2017*
  - **Systolic Data Flow of CNNs**: Developed algorithms for systolic data flow of Convolutional Neural Networks with analog-memory-based deep learning. Simulated forward propagation time and estimated a speedup over state-of-the-art GPUs by two orders of magnitude.
- **University of Chicago** — Chicago, IL
  Research Assistant — *June 2016 - March 2017*
  - **Cosmic Rays**: Analyzed the Fermi LAT database for possible gamma ray events from Jupiter's Great Red Spot. Concluded the GRS emits no significant gamma rays above 20 MeV.

Patents and Publications

- Burr, Geoffrey and **Killeen, Benjamin**. Efficient Processing Convolutional Neural Network Layers using Analog-Memory-Based Hardware. Provisional U.S. Patent filed October 12, 2018.
- Ambrogio, S., Narayanan, P., Tsai, H., Shelby,, R., Boybat, I., Nolfi, C.D., Sidler, S., Giordano, M., Bodini, M., Farinha, N., **Killeen, B.**, Cheng, C., Jaoudi, Y., and Burr, G. "Equivalent-Accuracy Accelerated Neural Network Training using Analog Memory." *Nature* 558:60 - 67 (2018).

Skills

Python • Tensorflow • C • C# • MatLab • JavaScript • LaTeX • Haskell • Emacs
Communication Skills • Scientific Writing • Experimental Design • Neural Networks

Projects

- **Artifice**: High precision object detection in scientific images, driven by Deep Neural Networks, available at github.com/bendkill/artifice .
- **Creative Writing**: Pursues independent creative writing projects.

Coursework

Unsupervised Learning and Data Analysis • Computer Vision • Networks and Distributed Systems
Operating Systems • Machine Learning on Big Data • Honors Combinatorics • Programming Languages
Scientific Visualization • Honors Algorithms • Honors Discrete Math • Computer Systems
Quantum Mechanics • Classical Mechanics • Electronics • Electricity and Magnetism • Statistics