

Kerry A. Seitz, Jr.

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<http://seitz.tech>

Education

- **University of California, Davis** Davis, CA
Ph.D. Student in Computer Science 2012 – Present
 - Advisor: John D. Owens
- **Trinity University** San Antonio, TX
B.S. in Computer Science 2008 – 2012
 - Minors in Biology and Biomathematics
 - Graduated Magna Cum Laude with Honors in Computer Science

Research Experience

- **University of California, Davis** Davis, CA
Graduate Research Summer 2012 – Present
 - Working under Dr. John D. Owens to design an abstraction for graphics pipelines
 - Implemented a compiler to transform pipeline code into efficient kernels for execution on the GPU and the CPU
 - Helped to design and implement a method for hierarchical object segmentation and detection
 - Continuing to develop the shader metaprogramming system started during my NVIDIA internship
- **Intel Corporation** Folsom, CA
Advanced Rendering Intern Summer 2017 – Fall 2017
 - Implemented a LLVM-based compiler to translate Microsoft's DirectX Intermediate Language (DXIL) to base LLVM IR with intrinsics
 - Implemented a LLVM-based code generator for a hardware simulator designed for preliminary hardware feature exploration
 - Developed techniques to improve hardware thread scheduling on GPU hardware
- **Nvidia Corporation** Santa Clara, CA
Graduate Research Intern Summer 2015
 - Developed a metaprogramming system for shaders that allows authoring shaders in the Terra programming language
 - Implemented a GLSL backend for the system
 - Implemented a shader programming model similar to Spark [Foley and Hanrahan 2011] using the metaprogramming framework
- **Apple Inc.** Cupertino, CA
Graduate Intern Summer 2014
 - Worked on a compiler frontend for shading languages, including feature development, feature implementation, and IDE integration
 - Implemented optimizations for the Sprite Kit framework
 - Developed features for LLVM-based tools
- **Intel Corporation** San Francisco, CA
Graduate Intern Summer 2013
 - Worked on a Clang- and LLVM-based compiler frontend for a programming model involving task and data parallelism

- **Trinity University** San Antonio, TX
Computer Science Honors Thesis *Spring 2011, Fall 2011 – Spring 2012*
 - Developed a bytecode and virtual machine with the goal of optimization in a heterogeneous environment
 - Implemented a hybrid interpreter/just-in-time compiler for the bytecode in Scala and OpenCL
- **DePaul University** Chicago, IL
National Science Foundation Research Experience for Undergraduates *Summer 2011*
 - Worked under Dr. Daniela Raicu and Dr. Jacob Furst to develop a genetic algorithm approach to reduce the number of image features used in content-based image retrieval of lung computed tomography (CT) scans
 - Created a technique to expand a limited set of diagnostically labeled images to include images for which a label could be confidently predicted
- **Trinity University** San Antonio, TX
National Science Foundation Undergraduate Biology and Biomathematics Fellowship *Summer 2010*
 - Investigated methods of ortholog detection across multiple taxa using DNA comparison methods as a participant in the Integrated Research in Biomathematics program under Dr. Kevin Livingstone
 - Refined Dr. Allen Orr’s model of the rate of speciation based on the Bateson-Dobzhansky-Muller model

Honors and Awards

- 2014** Awarded a National Science Foundation Graduate Research Fellowship Program (NSF GRFP) Fellowship
- 2011** Awarded Mach Research Fellowship
- 2008** Eagle Scout – Boy Scouts of America

Publications

Peer Reviewed Papers

- Anjul Patney, Stanley Tzeng, Kerry A. Seitz, Jr., and John D. Owens. Piko: A framework for authoring programmable graphics pipelines. *ACM Transactions on Graphics*, 34(4):147:1–147:13, August 2015.
- Anne-Marie Giuca, Kerry A. Seitz, Jr., Jacob Furst, and Daniela Raicu. Expanding diagnostically labeled datasets using content-based image retrieval. In *2012 19th IEEE International Conference on Image Processing (ICIP)*, pages 2397–2400, September 2012.
- Kevin Livingstone, Peter Olofsson, Garner Cochran, Andrius Dagilis, Karen MacPherson, and Kerry A. Seitz, Jr. A stochastic model for the development of Bateson-Dobzhansky-Muller incompatibilities that incorporates protein interaction networks. *Mathematical Biosciences*, 238(1):49–54, July 2012.
- Kerry A. Seitz, Jr. and Mark C. Lewis. Virtual machine and bytecode for optimization on heterogeneous systems. In *Proceedings of the 2012 Ninth International Conference on Information Technology – New Generations*, pages 528–533, April 2012.
- Kerry A. Seitz, Jr., Anne-Marie Giuca, Jacob Furst, and Daniela Raicu. Learning lung nodule similarity using a genetic algorithm. In *Proceedings of SPIE*, volume 8315, February 2012.

Conference Presentations

- Kerry A. Seitz, Jr., Tim Foley, and John D. Owens. Selos: Staged metaprogramming for shader system development. In *High-Performance Graphics 2017*, July 2017.

- Kerry A. Seitz, Jr., Anjul Patney, Stanley Tzeng, and John D. Owens. Realizing high-performance pipelines using Piko. In *GPU Technology Conference 2014*, March 2014.
- Kerry A. Seitz, Jr., Anjul Patney, Stanley Tzeng, and John D. Owens. Piko: A design framework for programmable graphics pipelines. In *GPU Technology Conference 2013*, March 2013.
- Kerry A. Seitz, Jr. and Mark C. Lewis. Implementing a heterogeneous bytecode interpreter in Scala. In *National Conference on Undergraduate Research*, March 2012.
- Andrius Dagilis, Karen MacPherson, and Kerry A. Seitz, Jr. Incorporating protein interaction probability into the Bateson-Dobzhansky-Muller model of speciation. In *Joint Mathematics Meeting*, January 2011.

Undergraduate Honors Thesis

- Kerry A. Seitz, Jr. The design and implementation of a bytecode for optimization on heterogeneous systems. Computer Science Honors Thesis, Trinity University, May 2012.

Other Publications

- Kerry A. Seitz, Jr., Alex Kennedy, Owen Ransom, Bassam A. Younis, and John D. Owens. A GPU implementation for two-dimensional shallow water modeling. arXiv:1309.1230 [cs.DC], September 2013.

Work Experience

- **University of California, Davis** Davis, CA
Co-Instructor *Winter 2016*
 - Co-instructor for EEC 289Q: Modern Parallel Computing
 - Wrote and presented course lectures, designed homework assignments, and advised students on final projects
- **University of California, Davis** Davis, CA
Teaching Assistant *Winter 2013*
 - Teaching assistant for ECS 20: Discrete Math for Computer Science
 - Taught a discussion section, held office hours, and graded homework and exams
- **Trinity University** San Antonio, TX
Teaching Assistant *Spring 2010, Fall 2010, and Fall 2011*
 - Teaching assistant for introductory biology labs
 - Aided the professor in teaching the weekly lab by answering student questions and explaining concepts used in lab and lecture
 - Helped prepare for lab each week

Leadership Experience

- **Trinity University** San Antonio, TX
President of the Association for Computing Machinery (ACM) *Summer 2011 – Spring 2012*
 - Planned and ran the weekly ACM meetings, sent updates and reminders to the ACM members, and helped plan events for computer science students and the Trinity University community
 - Tutored computer science students and recruited new students into the organization
- **Trinity University** San Antonio, TX
Treasurer of the Association for Computing Machinery (ACM) *Fall 2010 – Spring 2011*
 - Managed the ACM budget and helped plan events for computer science students and the Trinity University community