Dietrich Geisler

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Education

Cornell University, Computer and Information Science, Started August 2017, Expected Graduation May 2023
  PhD Candidate in Computer Science – Programming Languages and Compilers
University of Utah School of Computing and College of Science, Graduated May 2017   GPA: 3.56
  Honors Bachelor of Science Computer Science
  Honors Bachelor of Science Applied Mathematics
  Honors Bachelor of Science Mathematical and Physical Chemistry

Work Experience

- Research Assistant: Cornell University, Graphics Compiler Development (June 2018-Present)
- Intern: NVIDIA, Slang (internal graphics language) Compiler Development (May 2020-August 2020)
- Teaching Assistant: Cornell University, (January 2018-June 2018)
  - Head Teaching Assistant, Data Structures and Functional Programming
- Teaching Assistant: Cornell University, (August 2017-December 2017)
  - Object Oriented Programming and Data Structures
- Research Assistant: University of Utah, Floating Point Verification for C/C++ (January 2015-June 2017)

Project Experience

- Research Project: Heterogeneous Language IR (August 2020-Present)
  - Ongoing project to explore heterogeneous language optimizations across various devices
- Research Project: Heterogeneous Design in Slang (May 2020-Present)
  - Developed language feature for basic heterogeneous programming model in Slang
  - Ongoing research to explore static and dynamic dispatch interactions with heterogeneity
- Research Project: Geometry Types for Graphics Programming (February 2018-October 2020)
  - Publication accepted to OOPSLA 2020
  - Developed language (Gator) and semantics for type checking linear-algebraic operations and spaces
  - Implemented compiler from Gator to GLSL from the ground up in OCaml
  - Demonstrated type system by benchmarking graphics shader programs with TypeScript frontend
  - Managed total of 8 undergraduate students on various aspects of project
- Research Project: Translation Validation of the Packet Processing P4c Compiler (September 2017-June 2018)
  - Constructed a system for translating P4 HLIR and P4c-generated JSON to an SMT representation
  - Validated a large part of the compiler on the standard P4c test suite
- Research Project: Introduction of Floating-Point Types to Boogie and SMACK (January 2015-August 2017)
  - Created a formal floating-point type for Boogie, a Microsoft language written in C#
  - Added an equivalent floating-point type to SMACK, an academic C/C++ verifier written in C++
- Research Project: ML Approximation of DFT-Modeled Thermodynamic Systems (January 2016- August 2017)
  - Created a neural network framework using the NN library Torch in the table-based language Lua
  - Converted Leonard-Jones modelled thermodynamic data to neural network readable data
  - Testing various learning algorithms to determine optimal system learning environments
- Research Project: Construction of the Lie Groups from Associated Lie Algebras (September 2016- August 2017)
  - Professor-guided research project to classify differential manifolds and their associated tangent spaces
  - Developing a program to uniquely determine Lie Algebras from associated Dynkin Diagrams
  - Awarded a research stipend by the University of Utah Department of Mathematics to further research

Skills

Programming Languages: OCaml, C#, Python, C/C++, Java, GLSL, TypeScript, Verilog, Racket, Lua
Relevant Courses:

Advanced Compilers	Computer Architecture	Formal Methods	Advanced Algorithms	Computer Systems
Advanced Graphics	Programming Languages	Category Theory	Advanced Systems	Machine Learning

Areas of Interest: Programming Languages, Compiler Design, Graphics, Architecture, Formal Verification

Miscellaneous

- 2018 University Assembly and Graduate and Professional Student Assembly Representative