Andre Kuhlenschmidt

Contact Information

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Research Interests

I am interested in designing, building, and maintaining compilers, runtime systems, and type systems that make it easier to produce quality software. My most recent work focuses on the implementation of gradual type systems that provide the benefits of both static and dynamic typing, while minimizing the performance overhead that has been associated with gradual types.

Education

Indiana University, Bloomington, Indiana USA
Ph.D. Candidate, Computer Science, **May 2021**
Advisor: Jeremy Siek
M.S., Computer Science, **May 2016**
B.S., Business, Major: Entrepreneurship, **May 2010**

Experience

Indiana University, Bloomington, Indiana USA
Graduate Research Assistant **January 2014 – December 2020**

- Evaluate implementation techniques for sound gradually typed programming languages.
- Develop an ahead-of-time compiler Grift.
- Measure performance improvements in compiler via benchmark experiments.
- Design semantics that facilitate safety and efficiency.

Facebook, Seattle, Washington USA
Software Engineering Ph.D. Intern **May 2019 – August 2019**

- Extend Flow type checker to interactively edit code based on type inference.
- Extend Flow to automatically fix a class of errors that are cause by omitting type annotations.

Indiana University, Bloomington, Indiana USA
Assistant Instructor **January 2016 – May 2018**
August 2012 – May 2014

- Planned and constructed course materials and software for courses in programming language semantics and implementation, operating systems, and embedded systems.
- Instructed lab sessions of 5-30 students.
- Recognized as Assistant Instructor of the Year in 2018.

Conference Papers

Toward Efficient Gradual Typing for Structural Types via Coercions Andre Kuhlenschmidt, Deyaaeldeen Almahallawi, and Jeremy G. Siek. In Programming Language Design and Implementation 2019.

Skills

Languages: Racket, C, Haskell, Java, Python, Coq, C++
Tools and Platforms: Bash, Git, Make, Linux, Mac OS, Chibi OS, ARM

Refereed Articles

An Efficient Compiler for the Gradually Typed Lambda Calculus Andre Kuhlenschmidt, Deyaaeldeen Almahallawi, Jeremy G. Siek. In Scheme and Functional Programming Workshop, 2018.

A Systematic Performance Evaluation of Gradually Typed Functions and References. Andre Kuhlenschmidt, Deyaaeldeen Almahallawi, Jeremy G. Siek. In Scripts to Programs Workshop, STOP, 2016.

Towards Absolutely Efficient Gradual Typing Andre Kuhlenschmidt, Deyaaeldeen Almahallawi, and Jeremy G. Siek. In Scripts to Programs Workshop, STOP, 2015.

Open Source Projects

Grift **May 2014 – Present**

- Collaborator on an optimizing compiler for a gradually typed Lisp to native code.
- Utilizes *space-efficient coercions* to enforce soundness of the static type system, which results in a performance increase that is multiple orders of magnitude.

Professional Activities

IU Luddy Graduate Education Committee, Student Representative	January 2018 - August 2020
OOPSLA Artifact Evaluation Committee	August 2018
SPLASH Student Research Competition Program Committee	August 2018