Stefanos Baziotis

Room 4103, 201 N Goodwin Ave, Urbana, IL 61801
217-305-2934 sb54@illinois.edu https://sbaziotis.com
https://www.linkedin.com/in/stefanos-baziotis/ github.com/baziotis

Education

University of Illinois at Urbana Champaign (UIUC) **August 2021 – Present**
Ph.D in Computer Science *Champaign-Urbana, IL*

- Advisor: Prof. Charith Mendis

University of Athens **Sep. 2016 – July 2021**
B.Sc. in Informatics and Telecommunications *Athens, Greece*

- Thesis: *Designing Decoupled Compiler Transformation APIs*
- Supervisor: Prof. Yannis Smaragdakis

Research

UIUC **August 2021 – Present**

- Built Dias (github.com/ADAPT-uiuc/dias), an online, automatic, near-zero-overhead rewriter for Pandas code. I applied rewriting to library optimization, which results in high-level optimizations that cross library boundaries.

Princeton University **September 2020 – February 2021**

- I conducted research on automatic, speculative parallelization as part of the Liberty Research Group (liberty.princeton.edu).

University of Athens **Sep 2016 – July 2021**

- I developed decoupled compiler transformation APIs, a new direction in the design of optimizing compilers.

Publications

- *Dias: Dynamic Rewriting of Pandas Code*
  Stefanos Baziotis, Daniel Kang, Charith Mendis
  Accepted at SIGMOD 2024
  https://arxiv.org/abs/2303.16146

Professional Experience

NEC **July 2020 – April 2021**

- I developed an outer-loop vectorization legality analysis and a loop transformation framework that enables vectorization. Both have been merged in NEC's LLVM-based research compiler (github.com/sx-aurora-dev/llvm-project).
- Supervisor: Dr. Simon Moll

Notable Open-Source Contributions

LLVM

- I am one of the maintainers and I have written half of the Loop Terminology and Canonical Forms Documentation (llvm.org/docs/LoopTerminology.html)
- A couple of contributions to the Attributor, an interprocedural framework: D71799, D71787, D71435, D75780, D71960

Google Summer of Code - Dlang **May 2019 – August 2019**

- I created highly optimized versions of string.h utilities (memcpy, memmove, memset, memcmp). I wrote (SIMD-vectorized) x86_64 assembly, D and C versions.

Other Contributions to Dlang

- **LDC** (LLVM-based D Compiler)
  - Disable dead code when an if/else if condition is constant (#3134)
  - Add inbounds where possible (#3148)
- **D Runtime**
  - Add Saturation Arithmetic Intrinsics (#161)
  - llvm.minimum and llvm.maximum intrinsics (#162)

    * Add {load, store}Unaligned and prefetch wrappers in core.simd (#163)
- **D Language Specification**
    * Resolution of Template Alias Formal Parameters in Template Functions (DIP1023)
- **AuburnSounds - Intel Intrinsics**
    * A couple of contributions: #27, #29, #29, #32, #33, #34

Notable Projects

MiniJava Compiler | *C++, LLVM*

- Fastest MiniJava to LLVM IR compiler I know of.
- It does some miild optimizations in one-pass (constant folding, constant propagation, minimal loads / stores, dead-code elision / elimination)

2D Image Convolution | *C, MPI, OpenMP, SIMD*

- Multi-node (MPI) + Multi-threaded (OpenMP) + SIMD Vectorization
- Fastest CPU Parallel System *ever* in Parallel Systems class.

SQL Query Joiner | *C++, Pthreads*

- 4-level multi-threaded sort-merge-join.
- Fastest query joiner in the "Software Systems Project" class.

Talks

LLVM Developers' Meeting

- The Present and Future of Interprocedural Optimization in LLVM
- A Deep Dive into the Interprocedural Optimization Infrastructure
- Finding Your Way Around the LLVM Dependence Analysis Zoo

LLVM+CGO Workshop

- Latest Advancements in Automatic Vectorization Research

LLVM Social Bangalore

- Introduction to (Unconventional) Vectorization

Promotion of Open Source

- Google Summer of Code - Introductory Talk (Greek)
- Introduction to Google Summer of Code (Greek)
- Introduction to Open Source (Greek)

University Service

Teaching Assistant at UIUC

- Machine Learning for Compilers and Architectures, Fall 2023

Teaching Assistant at the University of Athens

- Compilers, 2020

Lab Assistant at the University of Athens

- Introduction to Programming, 2017
- Data Structures, 2018
- Computer Architecutre, 2018

Assignment Creation at the University of Athens

- I helped in the creation of the last assignment and I created the judge software.

Leadership

- I organize the Compiler/PL Meetup at UIUC, a weekly meetup that gathers together Compilers/PL students from various groups.
- I organized the Compiler Seminar on Fall 2022.

Relevant Coursework

- ML + Data Systems, Daniel Kang, UIUC, Fall 2023
- Cloud Storage Systems, Ramnatthan Alagappan, UIUC, Spring 2023
- Advanced Data Management, Yonjoo Park, UIUC, Fall 2022
- Compilers, Yannis Smaragdakis, University of Athens, Spring 2020

Languages

- Greek (Native)
- English (Fluent)
- French (Basic)