Sadler Alec

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About Me

I am a PhD candidate in compiler science specializing in performance optimization for ML and HPC workloads. My work centers on efficient code generation for modern parallel architectures.

EXPERIENCE

Kalray Feb. 2022 – Sept. 2022
Software Engineering intern Grenoble, FR
- Integrated the Machine Learning Compiler Framework TVM on the MPPA manycore architecture
- Experimented with TVM's autotuner Ansor to speedup inference on the MPPA
- Worked on TVM's Tensor-level IR to allow polyhedral loop transformation inside kernels

Inria May 2021 – Aug. 2021
Research Intern Lyon, FR
- Worked on compiler optimizations to improve register spilling in tensor programs
- Designed code generation schemes from polyhedral representations to further optimize the source program

Aston University May 2020 – Aug. 2020
Research Intern Birmingham, UK
- Implemented scientific simulation of Taylor-Couette flow in C++
- Optimizations using openMP, coupled with the use of SIMD instructions

Lyon 1 University Sept. 2023 – Present
Teaching Assistant - Compiler, OS, and concurrent programming Lyon, FR
- Led weekly lab sessions on compiler, concurrent algorithms, and operating systems
- Guided 30+ students through implementing compiler frontend and basic optimizations

Publications

New Insights on Scalar Promotion with the Polyhedral Model
- *IMPACT 2026-16th International Workshop on Polyhedral Compilation Techniques*

Automatic Specialization of Polyhedral Programs on Sparse Structures
- *IMPACT 2025-15th International Workshop on Polyhedral Compilation Techniques*

EDUCATION

Ecole Normale Supérieure Sept. 2023 – Present
PhD candidate in compiler science Lyon, FR
- **Thesis**: Automatic Parallelization of Sparse Codes for HPC and Machine Learning
- Designed static analysis on programs manipulating sparse matrices to improve load balancing and parallelization
- Developed polyhedral loop transformation passes to improve data locality and parallel scalability on sparse tensor workloads
- Designed algorithms to prove semantic equivalence between program fragments, enabling automatic recognition of BLAS micro-kernels in large codebases
- **Keywords**: compiler, static analysis, performance engineering, sparse tensors, polyhedral model
- **Additional Courses**: Lipari Summer School on Abstract Interpretation, MLIR winter School

Ecole Nationale Supérieure d'Informatique pour l'Industrie et les Entreprises Sept. 2019 – Sept. 2022
Master in computer Science, specialized in High Performance Computing Paris, FR
- **Coursework**: Data Structures, Algorithms, Computer Systems and architectures, HPC DevOps, compilers

SKILLS

Languages : Python, C, C++, CUDA
Compiler & IR : LLVM, TVM, ISL, MLIR
Parallel & HPC : OpenMP, AVX SIMD, Tensor Cores
Profiling : perf, nvprof
System : linux