Marisa Kirisame

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https://github.com/MarisaKirisame/

Education

2020–2021 **PhD**, *University of Utah*, Salt Lake City

2019–2020 **Master**, *University of Washington*, Seattle

2015–2019 **Bachelor**, *University of Washington*, Seattle

Experience

2020–2022 **CPU**, *Utah*, PHD Researcher
Worked on MemBalancer.
Continued working on DTR, increasing it's academic and industrial impact.

2015–2019 **PLSE**, *Seattle*, Undergraduate/Master Researcher
Worked on DTR at master.
Worked on TVM at junior/senior.
Worked on Cassius(https://cassius.uwplse.org/) and Verdi(http://verdi.uwplse.org/) at freshman.

Publications

[1] Marisa Kirisame, Steven Lyubomirsky, Altan Haan, Jennifer Brennan, Mike He, Jared Roesch, Tianqi Chen, and Zachary Tatlock. Dynamic tensor rematerialization. In *International Conference on Learning Representations*, 2021.

[2] Marisa Kirisame, Pranav Shenoy, and Pavel Panchekha. Optimal heap limits for reducing browser memory use, 2022.

[3] Jared Roesch, Steven Lyubomirsky, Marisa Kirisame, Josh Pollock, Logan Weber, Ziheng Jiang, Tianqi Chen, Thierry Moreau, and Zachary Tatlock. Relay: A high-level IR for deep learning. *CoRR*, abs/1904.08368, 2019.

Projects & Skills

DTR Developed an algorithm for gradient checkpointing. Currently upstreaming to pytorch. Adopted by Megengine, DELTA, and used in production.

MemBalancer Worked at controlling the garbage collector for v8, the javascript engine behind chrome. Utilize concurrent programming and garbage collection knowledge.

TVM Top 20 contributor. Contributed to the design of Relay, a higher order, differentiable IR. Implemented Algebraic Data Types, Automatic Differentiation, Reference, Pretty Printing, Ahead-Of-Time Compiler, Partial Evaluator, contributed to Type Inference.

7Tree Using CEGIS and Ltac's logical programming capability, build a push-button program synthesizer and verifier for a domain specific problem in Coq.

Happy-Tree A polytypic decision tree in Haskell that work on any True-Sums-Of-Products.

Ordinary A small web game to teach programming. Used Functional Reactive Programming, Nix, Zipper, and GHCJS.

PE Simply Typed Lambda Calculus with reference/product/sum with Bidirectional Type Checking, Partial Evaluation, Automatic Differentiation. Written in MetaOCaml so it can be compiled to OCaml.

Astraea Apply equality saturation to Compcert, a verified C compiler in Coq.

Prover An automated theorem prover for first order logic that use Gentzen's Sequent Calculus. Logic Formula represented as Generalized Algebraic Data Type using TMP in C++.

AI Implemented multiple search algorithms in AI Modern Approach, Including A Star, Bidirectional Breath First Search, Constraint Satisfication Programming with K Arch Consistency optimization. Heavily used Iterator Style and Boost to increase efficiency.

Language Fluent in Mandarin, Cantonese, and English.

Coursework

- Programming Languages, Deep Learning
- Advanced Computer Architecture
- Graduate Theoretical Computer Science
- Operating Systems
- Database
- Systems for Machine Learning