JIFENG WU

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SUMMARY

PhD student specializing in the intersection of machine learning, program analysis, compilers, systems, and computer architecture. Experienced in developing scalable tools, contributing to open-source projects, and publishing research at top-tier venues. Passionate about advancing software support for novel hardware platforms.

EDUCATION

CORNELL UNIVERSITY **Ithaca, NY**

PhD in Electrical and Computer Engineering **August 2025 - Expected June 2030**

- Advisor: Zhiru Zhang
- Focus: Program analysis, formal methods, and compilers for novel hardware platforms.

UNIVERSITY OF BRITISH COLUMBIA **Vancouver, Canada**

MSc in Computer Science **November 2024**

- Advisor: Caroline Lemieux
- GPA 4.0, Coursework: Software Engineering, Automated Testing, Type Systems, Deep Learning with Structure

WUHAN UNIVERSITY **Wuhan, China**

BEng in Software Engineering, Outstanding Graduate **June 2022**

- Advisor: Qingan Li
- GPA 3.93, Coursework: Operating Systems, Database Systems, Software Engineering, Embedded Software Design, Computer Systems: A Programmer's Perspective, Compilation Technology and Application

PUBLICATIONS

QuAC: Quick Attribute-Centric Type Inference for Python
Jifeng Wu, Caroline Lemieux
Proceedings of the ACM on Programming Languages, Issue OOPSLA, 2024

Effective Stack Wear Leveling for NVM
Jifeng Wu, Wei Li, Libing Wu, Mengting Yuan, Chun Jason Xue, Jingling Xue, Qingan Li
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2023

EXPERIENCE

CORNELL UNIVERSITY **Ithaca, NY**

Porting Deep Learning Applications to Neuron & Workflow Automation **September 2025 - Present**

- Refactoring deep learning applications (e.g., GPT-OSS, YOLO) to enable efficient model inference on Amazon Neuron hardware.
- Built *safetensors-layer-grabber* (available on PyPI), a utility for targeted extraction of model weights from HuggingFace SafeTensors files. Developing and publishing multiple PyPI packages to transform Python bytecode into SSA-form intermediate representations for static analysis.
- Developed a dynamic gray-box methodology for systematic analysis and simplification of PyTorch models, enabling the extraction of interpretable module hierarchies and automatic synthesis of minimal, weight-compatible skeletal classes; documented approach in a technical white paper: https://doi.org/10.5281/zenodo.18216741

UNIVERSITY OF BRITISH COLUMBIA **Vancouver, Canada**

QuAC: Quick Attribute-Centric Type Inference for Python **January 2023 - August 2024**

- Implemented QuAC, a novel Python type inference tool using attribute sets and information retrieval.
- Demonstrated high coverage and accuracy, outperforming non-LLM baselines, especially in predicting container type parameters and non-built-in types, while significantly reducing run times.
- Compared to LLM-based methods, QuAC is nearly two orders of magnitude faster while achieving greater consistency in its container type parameter predictions.
- GitHub: github.com/jifengwu2k/quac

WUHAN UNIVERSITY **Wuhan, China**

Effective Stack Wear Leveling for NVM **August 2021 - August 2022**

- Proposed Loop2Recursion, a stack wear leveling technique implemented as an LLVM pass for increasing the lifespan of NVM with limited write durability by converting wear-heavy loops into recursive functions.
- Outperforms state-of-the-art methods by significantly improving stack wear leveling and reducing performance overhead.
- GitHub: github.com/jifengwu2k/loop2recursion

INDIANA UNIVERSITY BLOOMINGTON **Bloomington, Indiana**

Automated Theorem Proving **September 2024 - March 2025**

- Conducted research under Prof. Sam Tobin-Hochstadt on Cheesecake, an inductive theorem prover leveraging SMT solvers and ACL2 heuristics. Investigated AI-based lemma conjecturing.

WUHAN UNIVERSITY **Wuhan, China**

Community Detection Using Social Networks and Trajectories **September 2019 - August 2021**

- Explored using trajectories to identify spatiotemporally cohesive user groups in large social networks.
- Developed a linear-time spatiotemporal trajectory similarity algorithm and community detection algorithm.
- Comprehensive evaluations on two datasets demonstrated the effectiveness and efficiency of these algorithms.

OPEN-SOURCE CONTRIBUTIONS

COPY-ON-WRITE LIST **Python 2+**

- An immutable, hashable, copy-on-write list-like data structure implementing the Sequence protocol.
- Supports O(1) indexing/slicing/appending-at-end and structural sharing.
- PyPI: pypi.org/project/cowlist

AVL ORDER STATISTIC SET **C++11**

- C++11 header-only self-balancing AVL set with O(log n) order-statistics/range queries.
- API-compatible with std::set, portable replacement for GNU PBDS.
- GitHub: github.com/jifengwu2k/avl-order-statistic-set

INTERACTIVE DEPENDENCY RESOLVER **Python 2+**

- A tool to interactively resolve Python wheel dependencies for debugging "dependency hell" scenarios.
- Supports platform/wheel compatibility, as well as dependency graph traversal.
- PyPI: pypi.org/project/interactive-dependency-resolver

LLMGCALPARSE **Python 2+**

- Git-style CLI for generating Google Calendar events from natural language descriptions using LLMs.
- Harnesses LLMs' generative power while respecting the proven workflows of classic command-line tools.
- PyPI: pypi.org/project/llmgcalparse

SDIAL **Python 2+**

- Command-line speed dial tool for quickly launching long commands by number.
- Supports multiline command editing via $EDITOR and passing arguments to commands.
- OS and shell agnostic, plain-text, backup-friendly storage.
- PyPI: pypi.org/project/sdial

CHATREPL **Python 2+**

- REPL shell for LLMs with an OpenAI Chat Completions-compatible API.
- Supports streaming responses, multiline input via $EDITOR, file integration, and conversation persistence.
- PyPI: pypi.org/project/chatrepl

FRAMEPERFECT **Python 2+**

- Lightweight GUI application for precise frame-by-frame video analysis.
- PyPI: pypi.org/project/frameperfect

SKILLS

- Languages: Python (Expert), C/C++ (Advanced), Bash.
- Frameworks: PyTorch, NetworkX, PyQt/PySide, LLVM, MLIR, Intel Pin, Git, Docker.
- Domains: Program Analysis, Formal Methods, Compilers, Automated Reasoning.

AWARDS

- 3x Outstanding Student Scholarship (Top 5%); 2x Advanced Individual in Social Work
- China Software Cup (Second Prize, 2020); Service Outsourcing Innovation and Entrepreneurship Competition for Chinese College Students (Third Prize, 2021)