


YUANTIAN DING

 github.com/YuantianDing  yuantianding.github.io  linkedin.com/in/yuantianand  ding360@purdue.edu

EDUCATION

Purdue University <i>Ph.D. Electrical and Computer Engineering, advised by Xiaokang Qiu</i>	<i>08/2022 - Present</i> <i>GPA: 3.91/4.00</i>
University of Science and Technology of China <i>B.E. Computer Science and Technology</i>	<i>09/2018 - 06/2022</i> <i>GPA: 3.97/4.3 (Ranked 6/251)</i>

COURSEWORK

Undergraduate Courses: Data Structures (A), Algorithms (A+), Operating Systems (A+).
Graduate Courses: Compiler Code Generation, Optimization And Parallelization; Deep Learning; Reasoning about Programs.

PROFESSIONAL SUMMARY

I am a third-year PhD student at Purdue University interested in program synthesis under the supervision of [Xiaokang Qiu](#).

PUBLICATIONS

Enhanced Enumeration of Techniques for Syntax-Guided Synthesis of Bit-Vector Manipulations Yuantian Ding, Xiaokang Qiu Proc. 51st ACM SIGPLAN Symposium on Principles of Programming Languages (POPL '24)	1/2024 (doi)
A Concurrent Approach to String Transformation Synthesis Yuantian Ding, Xiaokang Qiu Manuscript Submitted to PLDI '25	(Pending) (pdf)

EXPERIENCE

Nanjing University Internship <i>JFaaS - A New Serverless Platform with Customized JIT Design</i> With Zhiqiang Zuo (Nanjing University) Harry Xu (UCLA)	07/2021 - 12/2021 (more info)
<ul style="list-style-type: none"> Traditional runtime optimizations such as JIT compilation fail to enhance performance in modern FaaS¹ platform. As modern FaaS platform executes functions in an independent container, it can not leverage jitted code and profile information in other containers in JIT compilation. Leverage profile information sharing and native code sharing to improve performance. 	
SRI SSFT24 <i>The 13th Summer School on Formal Techniques</i> Summer school for learning techniques based on formal logic.	05/2024 (website)

AWARDS

ASC Student Supercomputer Challenge <i>First Prize</i>	2021
ACM-China International Parallel Computing Challenge <i>Third Prize</i>	2020

PROJECTS

DryadSynth <i>Dryad Synthesizer for SyGuS competition</i> A SyGuS solver designed by Purdue CAP, under active development.	24379 LOC (github)
<ul style="list-style-type: none"> I have enhanced DryadSynth with innovative techniques detailed in two of my research papers. Leveraging a combination of carefully designed deductive reasoning and LLM guidance, DryadSynth excels in synthesizing challenging bit-vector manipulations. It has successfully solved 31 new problems for the first time, outperforming other state-of-the-art methods. These advancements and experimental results are comprehensively presented in my (POPL '24) paper. 	

¹FaaS: Function-as-a-Service, a serverless concept, users upload functions in certain programming language to cloud service provider.

- DryadSynth also implements *asynchronous deduction*, as discussed in [\(draft\)](#), enabling it to surpass FlashFill++ on numerous benchmarks.

Oomotion | *A textobject-oriented editor plugin for VS Code*

4240 LOC

An editor inspired by Vim, Kakoune and Helix. With tree-sitter and easy-motion support.

[\(marketplace\)](#)

- Most common editors (VS Code, Vim, Helix etc.) navigate the text document based on unstructured plain text. Oomotion, instead, always navigates the document based on certain text-object: words, lines, paragraphs, code blocks, [tree-sitter](#) nodes, etc.
- Oomotion's cursor always selects a word by default, user can use *hjkl* keys to move cursor word by word. User can switch to other text-object mode easily.
- Oomotion provides a large range of text-objects operations, including [easy-motion mode](#) and coffeescript commands.

SKILLS

Programming Languages: C/C++, Python, Rust, Scala, Typescript

Tools: Git, Docker, SMT Solvers, VS Code, LLMs