

James Dong

github.com/j-dong
(832) 495-7338
dongj@stanford.edu

Education

SEPTEMBER 2021 - CURRENT

Stanford University – *Ph.D. in Computer Science*

GPA: 4.140/4.3

AUGUST 2017 - JUNE 2021

University of Texas at Austin – *B.S. in Computer Science (Turing Scholar, Honors)*

GPA: 3.99/4.0

Research Experience

MARCH 2022 - JUNE 2022

Thermal-Aware Scheduling for Monolithic Hardware (Tentative) – *Stanford University*

- Rotation project with Sara Achour
- Monolithic hardware is a type of 3D integrated circuit on a single wafer without TSVs
- Will evaluate software approaches to alleviate thermal concerns caused by greater density

JANUARY 2022 - MARCH 2022

GPU Kernel Optimization in Regent – *Stanford University*

- Rotation project with Alex Aiken
- Regent is a domain-specific programming language for Legion HPC programming system
- Identified optimization bottlenecks in TeraChem when implementing kernels in Regent
- Proposed language extensions to cleanly allow for better optimization and expressivity

SEPTEMBER 2021 - DECEMBER 2021

Relational Algebra as Sparse Array Programming – *Stanford University*

- Rotation project with Fredrik Kjolstad
- Developed model representing relational algebra operations over relations as sparse arrays
- Added several optimizations in production DBs as scheduling commands and passes

AUGUST 2020 - JUNE 2021

Solidare: Solidity Data Layout Optimization – *U. of Texas at Austin*

Maruth Goyal, James Dong, Yanju Chen, Yuepeng Wang, Yu Feng, and Isil Dillig. 2022.

Synthesis-Powered Optimization of Smart Contracts via Data Type Refactoring. In OOPSLA 2022 (Revision).

- Developing tool to optimize Solidity programs for gas usage by modifying data structures
- Implemented several heuristics to guide search based on syntactic and semantic criteria
- Designed language extensions to simulate type aliases for greater expressibility

JUNE 2018 - AUGUST 2018

Synthesizing Database Programs for Schema Refactoring – *U. of Texas at Austin*

Yuepeng Wang, James Dong, Rushi Shah, and Isil Dillig. 2019. Synthesizing database programs for schema refactoring. In PLDI 2019. ACM, 286–300.

DOI:<https://doi.org/10.1145/3314221.3314588>

- Developed Migrator, tool to rewrite database programs following a schema modification
- Created the concepts of value and join correspondence to constrain and guide search
- Implemented rewriting and correspondence enumeration procedures

Work Experience

MAY 2021 - AUGUST 2021

Google – *Software Engineering Intern (Canada, remote)*

- Developed static analysis tool for SPIR-V shaders
- Identified common sources of undefined behaviors in Stadia games
- Successfully detected several production bugs, including one during tool development

MAY 2020 - AUGUST 2020

Google – *Software Engineering Intern (Mountain View, remote)*

- Developed tool to identify threading-related bugs based on probabilistic ML model
- Collected stack traces using application profiling and user-submitted crash reports
- Evaluated performance on held-out dataset, obtaining over 85% overall accuracy

MAY 2019 - AUGUST 2019

Google – *Software Engineering Intern (Boulder)*

- Worked on Vulkan backend for ANGLE, translation layer for OpenGL ES graphics API
- Developed and improved several features in ES 3.2 specification
- Validated output against ES specification to ensure accuracy

Awards

- Turing Scholars Undergraduate C.S. Honors Program
- CRA Outstanding Undergraduate Researcher Award 2019, Honorable Mention
- International Collegiate Programming Contest South Central USA Regional 2019, 3rd place
- International Collegiate Programming Contest South Central USA Regional 2018, 2nd place

Graduate Coursework

- Automated Logical Reasoning
- Programming Languages
- Randomized Algorithms
- Graphics
- Physical Simulation

- Model Checking
- Program Synthesis
- Domain-Specific Programming Models/Compilers
- Software Engineering

Programming Experience

- Proficient: C++, Java, Python, Rust
- Familiar: Haskell, Scheme, TypeScript, Kotlin