

Lixun Zhang

3452 Lake Austin Blvd, Apt D, Austin, Texas

☎ (+972) 804-9382 | ✉ zhanglx@utexas.edu | 🌐 <https://github.com/zhanglx13>

Education

The University of Texas at Austin

PH.D. IN COMPUTER SCIENCE

- Dissertation: A Particle Filter Program Generator on GPU.

Austin, Texas

Jan. 2013 - Dec. 2021

Tsinghua University

B.S. IN ENGINEERING, AUTOMATION

Beijing, China

Sep. 2008 - Jul. 2012

Research Projects

Implementation of Monte Carlo Localization on Heterogeneous Systems

Jan. 2021 - Aug. 2021

- Implemented the Monte Carlo Localization algorithm using CUDA on Jetson TX2.
- Developed a framework for distributing particles among heterogeneous computing resources to accelerate the localization process.

An Analytical Performance Model for GPGPU kernels

Jan. 2019 - Dec. 2020

- Conducted a comprehensive literature review of GPU architecture and GPU performance models, through which obtained a deep knowledge of GPU execution model and architecture.
- Developed a mathematical model to estimate the execution time of simple kernels based on static analysis of CUDA assembly code.

Laser Power Control for Selective Laser Sintering

Sep. 2016 - Aug. 2017

- Built an automatic laser power control system to eliminate thermal gradients in the post-sintering temperature on the Laser Additive Manufacturing Pilot System.

A MATLAB to CUDA translator for Particle Filter Applications

Sep. 2014 - Aug. 2015

- Developed a front-end in C to translate MATLAB code of particle filter estimator into CUDA code.
- Developed domain-specific optimization passes in C for the generated CUDA code.

CUDA Implementation of Particle Filter Applications

Jun. 2013 - Aug. 2014

-

Internship

MathWorks

COMPILER ENGINEER, CODE GENERATION

Natick, MA

Jun. 2016 - Aug. 2016

- Wrote C++ pass to analyze for loops in the IR to find loop invariant variables.
- Generated intrinsic functions which expand to OpenMP pragmas in the code generation phase.
- Performed timing experiments of the generated code on multi-core systems.

Course Projects

CS380C Compilers

Jan. 2015 - May. 2015

- Wrote LLVM passes to perform domain-specific local optimizations.
- Implemented an iterative data-flow analysis framework and used it to implement both a forward data-flow analysis (Reaching Definitions) and a backward data-flow analysis (Liveness) using LLVM.
- Wrote LLVM passes to perform Dead Code Elimination and Loop Invariant Code Motion.

Teaching Assistant Courses

CS375 Compilers

Jan. 2018 - Dec. 2021

- Helped students build lexical analyzer (lex), parser (Yacc), and code generator for Pascal.
- Developed an autograder in Bash script for programming assignments.

CS380P Parallel Systems

Jun. 2019 - Aug. 2019

- Developed programming assignments for course projects: prefix sum using pthread, Kmeans using CUDA and Thrust, tree comparison using Go, and Barnes-Hut using MPI.
- Developed an autograder in Bash script for programming assignments.