Chuyue Zhang

Computer Engineer

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github.com/IronDumpling

Reference

Ian Kuon
Team Manager @ Intel Corp.
My team manager at Intel Corp. during my CO-OP internship.
Email: ian.kuon@intel.com

Chi-Guhn Lee
Professor @ University of Toronto
My supervisor at C-MORE Lab during my summer research internship in robotics.
Email: cglee@mie.utoronto.ca

Steve Engles
Professor @ University of Toronto
The co-supervisor of my capstone project at UofT.
Email: sengels@cs.toronto.edu

Education

9/2019 -5/2024 - Toronto, ON, Canada

University of Toronto

Bachelor of Applied Science and Engineering In Computer Engineering

CGPA (2019 - 2023): **3.75** / 4.0

AGPA (2020 - 2021): **3.91** / 4.0

Dean's Honour List: 4 semesters

Skills

Programming

C/C++	Familiar with algorithm, software, OS programming
Java/C#	Familiar with software programming
Python	Familiar with data processing and machine learning
HTML & CSS & JavaScript & React	Familiar with web frontend programming

Knowledge

Data Structure & Algorithm	Score: 91/100 A+
Computer Graphics	Score: 94/100 A+
Computer Network	Score: 87/100 A
Game Engine	Familiar with usage of Unity
Operating System	Familiar with concurrency, virtualisation and file system
Machine Learning	Familiar with deep and reinforcement learning

Projects

9/2023 - 12/2023

Linux Kernel Modules (github.com/IronDumpling/kernel-modules)

Environment: Linux & C & Git

Description: Several kernel modules to extend the functionality of Ubuntu OS

Responsibility:

- Developed a sub-process management utility for processes.
- Implemented a thread-safety concurrent hash table.
- Designed memory management unit and page table emulation system.
- Designed a user threads management system with all common functionalities such as thread create, schedule, join, yield, and exit.
- Developed an emulated file system based on Ext2 structure.

10/2023 - 12/2023

SmallC Compiler (github.com/IronDumpling/LLVM-small-C-IR-Generator)

Environment: Linux & C++ & ANTLR4 & LLVM

Description: A compiler built with ANTLR4 for a subset of language C called SmallC

Responsibility:

- Implemented tokens and grammar identification for smallC using ANTLR4.
- Implemented abstract syntax tree, symbols table, and semantic analysis.
- Implemented LLVM IR generation for smallC.
- Implemented dominator and post dominator analysis for the generated LLVM IR.

9/2022 - 12/2022

Computer Graphics (github.com/IronDumpling/computer_graphics_algos)

Environment: C++ & GLSL & Git

Description: Implement computer graphics algorithms in the course

Responsibility:

- Implemented algorithms such as ray casting, ray tracing, AABB box, Catmull-Clark polygon subdivision in C++.
- Implemented animation such as inverse kinematics and mass spring system in C++.
- Crafted shader to simulate earth, jupiter and moon in GLSL.

1/2021 - 5/2021

Easy Go Map (github.com/IronDumpling/easy-go-map)

Environment: ezGL & C++ & Git

Description: An offline GIS software, presenting global urban map data with navigation.

Responsibility:

- Implemented city maps with streets and building information from scratch.
- Developed a navigator with A* algorithm which provides driving instructions.
- Implemented greedy algorithms, simulated annealing, and multi-threading to tackle the NP-hard Traveling Salesman Problem, achieving top 15% in the course.

Projects (Cont.)

11/2022 - 6/2023

Backtrack (github.com/IronDumpling/Backtrack)

Environment: Unity & C# & Git

Description: A fixed-angle 3D level-based parkour game.

Responsibility:

- Designed game data manager and save load system.
- Built async scene loader with animation cut scenes. Handled camera switch, params adjust scripts using Cinemachine.
- Designed and implemented UI management center and UI using MVC.
- Crafted animation FSM and control scripts of UI, characters, and sceneries.

10/2021 - 11/2021

Text Conference (github.com/IronDumpling/udp-socket-text-conference)

Environment: C & Git

Description: A multi-client text conference program

Responsibility:

- Designed conference database to store users, and sessions information.
- Implemented multi-threading user account system.
- Implemented functionalities including create, join and leave session, send and receive public or private text.
- Implemented server to handle multiple sessions and clients.

7/2023 - Present

Wave Optics Education Platform (ece496-game-project.github.io)

Environment: Unity & WebGL & C# & HTML & CSS & Node.js & Git

Description: A website simulates phenomena. Teach students the knowledge of wave optics.

Responsibility:

- Crafted physics simulation algorithms of waves, polarizers, and waveplates.
- Implemented MVP and MVC pattern UI in C# and JavaScript for multiple models using Unity UI Toolkits, reflections, events, and JSON.
- Crafted free-perspective navigation editor feature like zoom, rotate and translation.

1/2022 - 5/2022

EmoNet (github.com/IronDumpling/EmoNet)

Environment: Python & Pytorch

Description: A deep neural network recognizes facial expression from webcam.

Responsibility:

- Implemented and trained deep neural network including AlexNet, ResNet.
- Designed the framework for training the model and using the model.
- Achieving the final training accuracy of the model 92.34% and F1 score of 0.75.

Work Experiences

5/2022 - 6/2023

Software Engineer @ PSG, Intel Corp.

Environment: Python & PANDAS & PostgreSQL & Perforce

Responsibility:

- Improved efficiency and developed feasible features for the tools used to analyze and compare Quartus chip data and actual chip data.
- Developed new features in the data query websites to customize chip data query.
- Handled chip database using tools such as PANDAS and PostgreSQL.

5/2023 - 8/2023

Research Intern @ C-MORE Lab, University of Toronto

Environment: Python & PyTorch & Gazebo & ROS2 & Ubuntu & Git

Responsibility:

- Built multi-robot exploration reinforcement and deep learning model.
- Implemented Bayesian optimization to find the optimal robot configuration.
- Generated 3D Gazebo worlds from 2D map scratches.
- Verified the effectiveness of the model and the optimization using ROS2.