

GUANXIONG CHEN

INCOMING M.SC. STUDENT · COMPUTER SCIENCE

University of British Columbia

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Education

University of British Columbia

MASTER OF SCIENCE IN COMPUTER SCIENCE

- Research focus: physics-based simulation

Vancouver, BC, Canada

Sept. 2021 - Nov. 2023 (expected)

University of British Columbia

BACHELOR OF APPLIED SCIENCE IN COMPUTER ENGINEERING

- GPA: 89%

Vancouver, BC, Canada

Sept. 2015 - May 2021

Research Experience

VCR (Verification, Control, Robotics) Group, University of British Columbia

Vancouver, BC

ADVISOR: PROF. IAN MITCHELL

May 2020 - Present

- Completed literature review on paper "Habitat: A Platform for Embodied AI Research"
- Conducting research to investigate impacts of delay, noise and jitter introduced by ROS on RL agents from AI Habitat
- Updated the Python-based interface between ROS and AI Habitat to work with Bullet Physics
- Developing scripts in Python to compare RL agents' performance in HabitatSim (a physics-based simulator) under discrete vs. continuous action spaces

SPIN (Sensory, Perception and Interaction) Group, University of British Columbia

Vancouver, BC

CO-ADVISORS: DR. SOHEIL KIANZAD, PROF. KARON MACLEAN

Sept. 2019 - Apr. 2021

- Contributed to paper "PAL: A Framework for Physically Assisted Learning through Design and Exploration with a Haptic Robot Buddy" (in review)
- Built a haptic pen with CAD features for creating scientific and engineering sketches
- Completed literature review of over 60 papers on sketching and haptic pens for STEM education
- Implemented a Python module for a haptic pen running on Raspberry Pi, to allow users define geometric relations between objects (eg. lines being parallel)
- Verified code correctness with a test suite

RESESS (Reliable, Secure, and Sustainable Software) Lab, University of British Columbia

Vancouver, BC

CO-ADVISORS: MR. MICHAEL CAO, PROF. JULIA RUBIN

May 2019 - Aug. 2019

- Analyzed malware samples from Google Play store
- Ran DroidNative (a ML-based malware detection tool) on Android app samples
- Preprocessed and extracted features from apps for training in DroidNative
- Wrote Python scripts to automate experiment deployment on remote servers

Coursework and Personal Projects

Deep Learning-based Road Damage Detection System

COURSEWORK FOR CPEN 491: COMPUTER ENGINEERING CAPSTONE DESIGN

Sept. 2020 - May 2021

- Prepared a literature review on over 20 existing road damage detection techs, well-received by our client
- Established system specs based on limitations of existing techs and stakeholder needs
- Trained a novel CNN model on a remote cluster to classify and localize road damages from RGB images
- Analyzed the model's architecture with generalization theory to explain its performance

Simple Ray Tracer

COURSEWORK FOR CPSC 314: COMPUTER GRAPHICS

Nov. 2020 - Dec. 2020

- Modified the C++-implemented rendering engine by Peter Shirley in *Ray Tracing in One Weekend*
- Implemented geometries including triangles, cubes and torus
- Implemented ray-traced shadows and Blinn-Phong shading model

Jack in a Box (A Blackjack Game Machine)

COURSEWORK FOR CPEN 391: COMPUTER ENGINEERING DESIGN STUDIO II

Jan. 2020 - Mar. 2020

- Implemented a KNN-based image recognition pipeline in Python to recognize poker cards' face values
- Collected and preprocessed data to build a dataset over 18,000 images for training and evaluation
- Implemented with a teammate the game's mechanics in a bare-metal C program targeted for an ARM processor on a Raspberry Pi

Simple Image Processing SoC

COURSEWORK FOR CPEN 311: DIGITAL SYSTEMS DESIGN

Mar. 2018

- Implemented independently an accelerator used for accelerating affine rotations of 2D images on a FPGA chip
- Built the system with EDA tools from basic blocks - a soft-core CPU, memories, and the accelerator
- Wrote code in C to evaluate the accelerator's speed-up

Awards, Fellowships, & Grants

NSERC Undergraduate Student Research Award

NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL

2021, 2019

- The award intends to develop Canadian students with outstanding academic backgrounds as potential researchers.

Jim and Helen Hill Memorial Service Award

DEPT. OF ELECTRICAL AND COMPUTER ENGINEERING, UBC

2019

- The award is given to students who demonstrated leadership through volunteerism.

Trek Excellence Scholarship

UNIVERSITY OF BRITISH COLUMBIA

2017

- The Scholarships are offered every year to students in the top 5% of their undergraduate year, faculty, and school.

Chancellor's Scholar Award

UNIVERSITY OF BRITISH COLUMBIA

2015

- Award for students who enter the UBC Vancouver campus with outstanding academic backgrounds.

Teaching Experience

Fall 2020 CPEN 331: Operating Systems, Teaching Assistant

Fall 2018 CPEN 311: Digital Systems Design, Teaching Assistant

Outreach & Professional Development

SERVICE AND OUTREACH

2016 - UBC Opening and Move-in Day, Move-in Volunteer

2016 UBC AMS Bike Kitchen Daily Maintenance, Bike Repair Volunteer

PROFESSIONAL MEMBERSHIPS

Engineers and Geoscientists BC