

# GUANXIONG CHEN

B.A.Sc. STUDENT · COMPUTER ENGINEERING

University of British Columbia

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## Education

### University of British Columbia

BACHELOR OF APPLIED SCIENCE IN COMPUTER ENGINEERING

- GPA: 89%

Vancouver, BC, Canada

September 2015 - Present

## 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"
- Updated an interface between ROS and AI Habitat to work with Bullet Physics
- Developed scripts in Python to compare RL agents' performance with 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 - Present

- Working on paper: "Haptic Geometric Relationships in Physical Drawing" (working title)
- Completed literature review of papers on sketching and haptic pen
- Wrote Python code to allow users define geometric relations between objects in CAD sketches drawn with a haptic pen
- Designed experiments for the user study

### 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 - Present

- Reviewed over 20 existing road damage detection technologies from academia and industry
- Established system specs based on limitations of existing techs and stakeholder needs
- Led the team to write proposal and design document, recognized by the instructor as "the best documents" ever for the course
- Selected RGB+LiDAR sensors for data collection and designed collection method
- Training a model implemented in TensorFlow using labelled data

### 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

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### 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.

### NSERC Undergraduate Student Research Award

NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL

2019

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

### 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

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Fall 2020 CPEN 331: Operating Systems, Teaching Assistant

Fall 2018 CPEN 311: Digital Systems Design, Teaching Assistant

## Outreach & Professional Development

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### 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