GUANXIONG CHEN

B.A.Sc. Student · Computer Engineering

University of British Columbia

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Education

University of British Columbia *Vancouver, BC, Canada*

Bachelor of Applied Science in Computer Engineering *September 2015 - Present*

- GPA: 89%

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"
- Building an interface in Python between ROS and AI Habitat framework
- Deploying experiments to evaluate 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

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

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 Maintainance**, Bike Repair Volunteer

Professional Memberships

Engineers and Geoscientists BC