GUANXIONG CHEN

B.A.Sc. Student · Computer Engineering

University of British Columbia

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Skills

Techs **Python, C, C++, Java, ROS, Machine Learning, Simulation, Embedded Software**

Other Skills **Working in Teams, Communication (Oral & Written)**

Work Experience

Undergraduate Research Volunteer - Simulation & Robotics *Vancouver, BC*

Department of Computer Science, UBC *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

Undergraduate Teaching Assistant - Operating Systems *Vancouver, BC*

Department of Electrical and Computer Engineering, UBC *Sept. 2020 - Dec. 2020*

- Marked 6 programming assignments covering OS-related concepts, e.g. processes, file I/O, virtual memory
- Supervised 3-hour-long labs per week, and held TA office hours
- Answered students' questions on assignments during labs and on Piazza

NSERC USRA Research Intern - Mobile Security *Vancouver, BC*

Department of Electrical and Computer Engineering, UBC *May 2019 - Aug. 2019*

- Analyzed malware samples from the Google Play store using static analysis techniques
- Ran DroidNative (an open-source malware detection tool) on over 1,000 Android app samples
- Wrote up Python scripts to automate experiment deployments inside VMs hosted on remote servers
- Preprocessed and extracted features from apps for training in DroidNative
- Optimized DroidNative (written in C++) to speed up feature extraction by 2X+

Undergraduate Teaching Assistant - Digital Systems Design *Vancouver, BC*

Department of Electrical and Computer Engineering, UBC *Sept. 2018 - Dec. 2018*

- Made over 200 contributions on Piazza to address students' questions related to course material and logistics
- Helped students design, simulate and implement FPGAs in 3-hour lab sessions each week
- Marked exams and lab assignments, set up marking rubrics with the course instructor and other TAs
- Assisted constructing auto-grading test suites
- Received overwhelmingly positive reviews from both students and the instructor

Coursework and Personal Projects

Deep Learning-based Road Damage Detection System *Sept. 2020 - Present*

Coursework for cpen 491: Computer Engineering Capstone Design

- Reviewed over 20 existing road damage detection technologies from academia and industry
- Established system specs based on limitations of existing techs and stakeholder needs
- Prepared 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 to detect road damages

Simple Ray-traced Rendering Engine *Nov. 2020 - Dec. 2020*

Coursework for cpsc 314: Computer Graphics *Source*

- 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) *Jan. 2020 - Mar. 2020*

Coursework for cpen 391: Computer Engineering Design Studio II *Source*

- Implemented a KNN-based image recognition pipeline in Python to recognize poker cards' face values, and achieved 99% accuracy in evaluation
- 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 *Mar. 2018*

Coursework for cpen 311: Digital Systems Design *Source*

- 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

Education

University of British Columbia *Vancouver, BC, Canada*

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

- GPA: 89%

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.

Outreach & Professional Development

Service and Outreach

2019 - **UBC SPIN (Sensory Perception & Interaction) Group**, Undergraduate Research Volunteer
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