Shuyu van Kerkwijk

Vancouver / Toronto svankerk@student.ubc.ca Portfolio Linkedin Github

Education

University of British Columbia (GPA: 93%) *Sept 2022 – May 2027*
BASc Engineering Physics, BSc Honours Computer Science & Physics

- **Coursework:** Probability, Linear Algebra, ODEs, PDEs, Signals and Systems, Reinforcement & Imitation learning, Data Structures & Algorithms, Digital Systems, Microcomputers, Instrument Design

Research Experience

Caltech DSA-2000 Radio Array, Software Intern *Pasadena, CA*
Recipient of Caltech SURF Award under Dr. Vikram Ravi *May – Aug 2025*

- Here is a description of the DSA-2000 project and my approved proposal on characterizing the test array.
- Developing the software pipeline for raw cross-correlation data, including fringe stopping and phase correction.

UBC-NASA CGEM Telescope, Electrical Intern *Vancouver, BC*
Recipient of national NSERC USRA Award under Dr. Mark Halpern *Apr 2024 – May 2025*

- Built and validated the azimuthal and elevation angle pointing data systems for the telescope.
- Optimized ADC signal chain, reducing artifacts, quantization error, 60Hz radiated pickup, and aliasing.
- Programmed STM F4/H7 microcontrollers, RPis, and FPGA for fast data acquisition and networking.

UofT LT Research Institute, Research Student *Toronto, ON*
Recipient of UofT SUDS Award under Dr. Mei Zhen *May – Aug 2023*

- Built a pipeline for 3D neuron-reconstruction from 2D image slices using image and graph algorithms.
- Trained a U-Net CNN to segment nuclei, as part of a global effort to generate full brain connectivity models.
- Presented 2x award-winning research on stress-induced neuron structural changes at conferences

Projects

Flatiron Institute (Simon's Foundation) CryoJax *(2025)* *Github*

- Contributing to CryoJax, a cryo-EM simulation framework, by implementing its first physical solvent model.

Self-Driving Robot Competition *(2025)*, 1ST PLACE *Link*

- Trained an end-to-end imitation learning model in ROS/Gazebo for real-time autonomous navigation.
- Built a custom CNN in TensorFlow for real-time alphanumeric character recognition on road-signs

Burger-Cooking Robot Competition *(2024)* *Link*

- Built an autonomous 22-DOF robot with vacuum-based crane arms to cook and assemble burgers.
- Developed FreeRTOS firmware coordinating 3 microcontrollers and 40+ calibrated sensors/actuators.
- Designed and soldered custom PCBs (motor drivers, bandpass filters, etc.) and fabricated chassis components.

National Physics Team *(2021-2022)*, 2ND PLACE *Finals*

- Selected for IYPT Team Canada based on national performance; researched and presented fluid flow problems.

Skills

Languages: Python, C++, C, Java, SQL, Assembly, VHDL *& English, Dutch, Mandarin*

Technologies: JAX, TensorFlow, PyTorch, ROS1, Gazebo, ImageJ, NumPy, Pandas, Scikit-learn, OpenCV, PyQt, KiCad, STM32CubeIDE, PlatformIO, Excel, Git

Awards

Academic: UBC Charles & Jane Banks Scholarship, UBC Dean's Scholar, UTS W. Livingstone Physics Prize

Other: Scratch Featured Project (age 11), 2nd at Volleyball Nationals (2024), Harold Smith Essay Award