BOXIANG (WILLIAM) FU

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EDUCATION

Carnegie Mellon University *2024 - 2026*
M.Sc. in Robotic Systems Development (*GPA 4.33*)

University of Melbourne *2019 - 2023*
B.Sc. in Mathematical Physics (*Rank: 2nd/2400+ [Proxime Accessit], First Class Honours, WAM 95.714*)
B.Com. in Economics and Finance (*Rank: 1st/1800+ [University Medalist], First Class Honours, WAM 95.105*)
Dip.Lang. in Chinese Studies (*Second Class Honours Division A, WAM 78.750*)

WORK EXPERIENCE

Research Intern in Quantum Proof-of-Work Algorithms *Nov 2022 - Feb 2023*
BTQ Technologies *Sydney, Australia*

- Proved the sufficient conditions for the existence of a Nash equilibrium payoff mechanism that incentivizes honest behaviour and penalizes cheating behaviour in a non-deterministic proof of work boson sampling consensus protocol.
- Introduced generalizations of the model to account for non-quantum player interactions, heterogeneous cost factors, optimal block vs. split reward mechanisms, and protocol initialization.

RESEARCH EXPERIENCE

Lunar ROADSTER Autonomous Moon-Working Rover [Website] *Sep 2024 - Present*
Robotics Institute, Carnegie Mellon University *Pittsburgh, USA*

- Built the teleoperation stack of the rover by taking in user joystick inputs and encoder information, processing it on a NVIDIA Jetson, and translating the command into MicroClaw actuator controls via an Arduino UNO.
- Implemented the localization stack of the rover using EKF and sensor data from wheel encoders, IMU, and total station.

Non-Rigid Multi-Perspective Camera Pose Estimation *Dec 2023 - Apr 2024*
Mobile Perception Lab, ShanghaiTech University *Shanghai, China*

- Extended the static non-rigid multi-perspective camera pose estimation problem to the dynamic case involving 6 DOF.
- Participated in building a dynamic physics-based deformation model of a non-rigid multi-perspective camera system using a convolutional neural network. Primarily responsible for mathematical and physical derivations.

Geothermal Energy: Economics and Technical Viability *Jan 2022 - Jan 2023*
SGIL Lab, The University of Melbourne *Melbourne, Australia*

PUBLICATIONS & PATENTS [Full List]

- Singh, D.; Muraleedharan, G.; **Fu, B.**; Cheng, C.; Newton, N.; Rohde, P.; Brennen, G. Proof-of-Work Consensus by Quantum Sampling. Quantum Science and Technology 2025, 10, 2. https://doi.org/10.1088/2058-9565/adae2b
- **Fu, B.**; Rohde, P.; Singh, D.; Muraleedharan, G.; Brennen, G. (2024). *Improved Blockchain System and Method.* European Patent Application EP 4 472 126 A1. European Patent Office.
- **Fu, B.**; Beardsmore, G.; Webster, R. Economic Performance Indicators for a Geothermal Aquatic Center in Victoria, Australia. Energies 2023, 16(5), 2134. https://doi.org/10.3390/en16052134
- Research posters on quantum key distribution [1], lattice reduction with applications to cryptography [2], and Latrobe valley geothermal economic modelling [3]

PROJECTS [Full List]

- Implemented a 3D reconstruction algorithm from multi-view 2D detections using the eight-point epipolar geometry algorithm with bundle adjustment [Repo]
- Implemented a particle filter with dynamic ESS resampling for pose estimation [Repo]
- Implemented a cascaded and L-1 adaptive controller on a quadrotor drone [Repo]

AWARDS AND EDUCATIONAL ACHIEVEMENTS [Full List]

- Proxime Accessit (B.Sc.) (2023)
- Leaders in Communities Award (2022)
- School of Physics Laby Research Scholarship (2022)
- Melbourne National Merit Scholarship (2018)
- University Medal (B.Com.) (2021)
- Dean's Honours List (all year levels) (top 3%)
- School of Mathematics Vacation Scholarship (2022)
- Goda Firkins Academic Medal of Excellence (2017)

TECHNICAL COMPETENCIES AND PERSONAL INFORMATION

Programming Skills	Python, C, C++, R, MATLAB, SAS, ROS2, Git, LaTeX, CAD, Arduino, MuJoCo
Technical Knowledge	Motion Planning, Decision Making, PID, MPC, EKF, UKF, Particle Filter, Sensor Fusion Manipulator Kinematics, Robot Learning, Convex Optimization, Neural Networks
Relevant Coursework	Robot Mobility, Manipulation, Estimation, Control, Autonomy; Systems Engineering; Computer Vision; Data Processing; Differential Equations; Vector Calculus; Analysis; Probability; Statistics; Linear Algebra; Electromagnetism; Classical/Lagrangian Mechanics
Extracurricular Activities	Physics Students' Society (Treasurer), Chinese Students and Scholars Association (Treasurer)
Work Authorization	Australian citizenship, eligible for E-3 visa and does not require H-1B sponsorship