KERRY HE

EDUCATION

Monash University Clayton, VIC 3800, Australia 2022 – Present
Doctor of Philosophy
Electrical and Computer Systems Engineering
Advisors: James Saunderson and Hamza Fawzi
Expected completion date: Oct 2025

Monash University Clayton, VIC 3800, Australia 2017 – 2022
Bachelor of Engineering (Honours) and Bachelor of Commerce
Major in Mechatronics and Finance
WAM: 93.348/100; **GPA**: 3.975/4

RESEARCH EXPERIENCE

Doctor of Philosophy 2022 – Present

- Researching convex optimization methods for quantum information theory.
- Supervising summer research students in the Summer of 2022-2023

Summer Research Scholarship 2022

- Developed an optimal control algorithm for robotic arm which avoids obstructing important information from a camera view.
- Published research in IEEE RA-L (2022) as co-author and presented at ICRA (2022).

Engineering Honours Project 2021

- Designed a model predictive controller for an autonomous Formula-style racecar.
- Investigated ways to formulate an optimal control problem and to discretise it using various direct methods into an optimization problem.

Summer Research Scholarship 2021

- Developed an algorithm to digitally stabilize video feeds of cameras mounted on crane hooks for use in a crane automation PhD project.
- Published and presented research as first-author in ARAA ACRA (2021).
- Won 3rd place in poster competition and MAE department nominee for 5-minute presentation.

Research Assistant 2020

- Implemented a learning-based approach for a robotic arm to rotate a grasped object to place the object down in a stable orientation.
- Published research in IEEE RA-L (2021) as co-author and presented at ICRA (2021).

RESEARCH INTERESTS

Convex optimization; quantum information theory; robotics; optimal control; trajectory planning

TEACHING/EXTRACURRICULAR EXPERIENCE

Monash Motorsport 2018 – 2021

- Autonomous Systems department member involved in developing perception, localisation, and planning algorithms for Australia's first autonomous Formula Student racecar.
- Held multiple leadership roles, including:
    - Head of Autonomous Systems (2020): Leading and mentoring the department, making high level technical decisions, facilitating communications with other departments.
    - Autonomous Systems Principal Engineer (2021): Involved with giving technical advice to department members and management.
- Responsible for designing path planning and motion control subsystems.

Teaching Assistant 2019 – Present

- ECE3093 Optimisation and Numerical Methods for Engineers (2024 – Present).
- ECE4132 Control System Design (2023 – Present).
- TRC2201 Mechanics and TRC3200 Dynamical Systems (2019 – 2023).

SELECT PUBLICATIONS & PREPRINTS

K. He, J. Saunderson, H Fawzi, "Efficient Computation of the Quantum Rate-Distortion Function," *arXiv preprint arXiv:2309.15919*, 2023.

K. He, J. Saunderson, H Fawzi, "A Bregman Proximal Perspective on Classical and Quantum Blahut-Arimoto Algorithms," *arXiv preprint arXiv:2306.04492*, 2023.

K. He, W. P. Chan, A. Cosgun, A. Joy, and E. A. Croft, "Robot Gaze During Autonomous Navigation and Its Effect on Social Presence," in *International Journal of Social Robotics*, 2023, pp. 1-19

K. He, R. Newbury, T. Tran, J. Haviland, B. Burgess-Limerick, D. Kulić, P. Corke, and A. Cosgun, "Visibility Maximization Controller for Robotic Manipulation," in *IEEE Robotics and Automation Letters*, vol. 7, no. 3, pp. 8479-8486, July 2022

K. He, P. Simini, W. P. Chan, D. Kulić, E. Croft and A. Cosgun, "On-The-Go Robot-to-Human Handovers with a Mobile Manipulator," 2022 31st *IEEE International Conference on Robot and Human Interactive Communication*, Napoli, Italy, 2022, pp. 729-734

R. Newbury, K. He, A. Cosgun and T. Drummond, "Learning to Place Objects Onto Flat Surfaces in Upright Orientations," in *IEEE Robotics and Automation Letters*, vol. 6, no. 3, pp. 4377-4384, July 2021.

AWARDS AND HONOURS

Monash Graduate Excellence Scholarship (2022 – 2025)

University Medal for Undergraduate Academic Excellence in the Faculty of Engineering (2022)

Dean's Student Excellence Award for the top Undergraduate in Commerce (2022)

T.F. Berreen Prize for Excellence in Engineering Dynamics (2019)

Engineering Deans Honour List (2017, 2018, 2019, 2020, 2021)

Monash Business School Student Excellence Award (for ACC1100, BFC2140, BFC2751, BFX3355, and ETC3460)