MAX YANG

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EDUCATION

PhD Engineering Mathematics, University of Bristol Bristol, United Kingdom 2021 ▸ 2025 (Anticipated)

Department of Engineering Mathematics and Bristol Robotics Laboratory

EPSRC funded PhD, supervised by Prof. David Barton and Prof. Nathan Lepora.

Research Theme: Towards real-world dexterous manipulation with tactile sensing using physics-based simulators and sim-to-real deep reinforcement learning.

MEng Aeronautical Engineering, Imperial College London London, United Kingdom Sep 2015 ▸ Jun 2019

Department of Aeronautics

Integrated Master's Degree. Obtained 1st Class Honours. Result: 77%

Thesis: "Optimal Control and its Role in Cancer Treatment" supervised by Dr. Thulasi Mylvaganam.

WORK EXPERIENCE

Teaching Assistant, University of Bristol Jan 2022 ▸ Now

- Assisted in Applied Statistics and Further Computer Programming units; coordinated lab sessions and was responsible for supervising and evaluating final projects.
- Co-supervised Msc projects in physics-based simulation for dexterous manipulation, visuotactile manipulation, and additional summer projects in RL for tactile robotics.
- Prepared and showcased robot manipulation demonstrations during university open days.

Research and Development Engineer, Sagentia Innovation Sep 2019 ▸ Sep 2021

- Implemented vision models (Mask R-CNN and U-Net) for agricultural navigation and vine detection.
- System identification and tuning of high-precision surgical motor.
- Full stack development of emotion detection web app.
- Demonstrated expertise in conducting market research, capturing requirements, and effectively planning and executing technical projects.

Undergraduate Assistant, Imperial College London Jan 2019 ▸ May 2019

- Provided support during Computing labs to ensure smooth lab operations.

Research and Technology Summer Intern, Airbus Jun 2018 ▸ Sept 2018

- Investigated the application of predictive maintenance for the latest A350 aircraft, examining the current data transmission pipeline and performing feasibility analysis.

PUBLICATIONS

[1] Lin, Y., Church, A., **Yang, M.**, Li, H., Lloyd, J., Zhang, D. and Lepora, N.F., 2023. Bi-Touch: Bimanual Tactile Manipulation with Sim-to-Real Deep Reinforcement Learning. *IEEE Robotics and Automation Letters.*

[2] **Yang, M.**, Lin, Y., Church, A., Lloyd, J., Zhang, D., Barton, D.A. and Lepora, N.F., 2023. Sim-to-Real Model-Based and Model-Free Deep Reinforcement Learning for Tactile Pushing. *IEEE Robotics and Automation Letters.*

[3] Fan, W., **Yang, M.**, Xing, Y., Lepora, N.F. and Zhang, D., 2023. Tac-VGNN: A Voronoi Graph Neural Network for Pose-Based Tactile Servoing. *IEEE International Conference on Robotics and Automation*

Conference and Workshop Presentations

Generalizable and Robust Tactile Pushing using Sim-to-Real Deep Reinforcement Learning
ICRA 2023 Vitac Workshop June 2023

Vision and Tactile Pose Identification for Picking a Target without Collision
ICRA 2023 Vitac Workshop June 2023

Robust Goal-Conditioned Tactile Pushing using Deep Reinforcement Learning
The 4th UK Manipulation Workshop Jan 2023

Professional Services

Robotics: Reviewer of ICRA (2024), RA-L (2023), IROS (2023)

Relevant Projects

General In-hand Object Rotation with Tactile Sensing

- Investigating the advantages of rich tactile feedback for in-hand object rotation via precision grasps, utilizing the allegro hand equipped vision-based tactile sensors.

Deep Reinforcement Learning for Goal-Conditioned Tactile Pushing

- Application of model-based and model-free reinforcement learning for long-horizon goal-conditioned object pushing with touch.

Robosoft 2023 Manipulation Competition: Integrated System for Robot Food Handling

- Led the development of vision-tactile robotic system to perform food pick-and-place and pouring tasks.

Final Year Project: Optimal Control for Cancer Treatment

- Designed an optimal control algorithm to optimize the delivery of chemotherapy during cancer treatment using a mathematical model of tumor growth and its response to treatment.

Awards and Honors

EPSRC Doctoral Training Partnership PhD Studentship 2021-2025
Imperial Aeronautics Scholar 2017
Ian Ross Scholarship for STEM Undergraduate Students 2016

Skills

Programming Language:	Python, C/C++, C#, MATLAB and Simulink
Software:	Pytorch, TensorFlow, Git, ROS, IsaacGym, Pybullet, Unity3D
Research Interest:	Reinforcement Learning, Optimal Control, Dexterous Manipulation, Tactile Sensing, Sim-to-Real Transfer
Language:	English, Mandarin