# Zhiyin Xu

Ningbo, China 315100 / +86 15381931200 / sqyzx1@nottingham.edu.cn

## EDUCATION

**The University of Nottingham Ningbo China** Sep. 2019 - Jul. 2023

- BEng Hons Aerospace Engineering
- GPA: 3.95/4.0 Rank: 1st
- Summer Mini Semester Programme: Basic Programming Skills with Project Aug. 2020

**Coursera - Online** Jul. 2022 - Aug. 2022

- University of Pennsylvania: Robotics: Aerial Robotics, Robotics: Computational Motion Planning, Robotics: Estimation and Learning

## PATENTS

**Design of a Lightweight and High Strength Base Structure for Gantry Machines Fitting Non-Foundation Environments.** China Patent No. ZL 2022 2 0534297. X, filed on Mar. 11, 2022, and issued on Sep. 9, 2022.
**Column of Drilling and Tapping Machine.** China Patent No. ZL 2022 2 0541411.1, filed on Mar. 11, 2022, and issued on Jul. 12, 2022.
**5-Axis Laser Cutting Machine.** China Patent No. ZL 2021 2 3078545.9, filed on Dec. 9, 2021, and issued on Aug. 30, 2022.
**Disk-type Tool Magazine of Computer Numerical Control Machine.** China Patent No. ZL 2021 2 3078535.5, filed on Dec. 9, 2021, and issued on May 13, 2022.

## RESEARCH EXPERIENCE

**Deep Reinforcement Learning for Drone Remote-sensing in Multi-target Environments** Jun. - Aug. 2022
*RA to Assistant Professor Saeid Pourroostaei Ardakani*

- Built a mathematical model to simplify the problem, setting the size of the Unmanned Aerial Vehicles (UAVs) and the environment as well as the size, quantity, and location of targets and obstacles.
- Constructed the environment model in Python and set reasonable rewards.
- Implemented Q-learning as a reinforcement learning algorithm and Deep Q-learning (DQN) or Double Deep Q-learning (DDQN) as a deep reinforcement algorithm to find the best fitted and shortest flight routes.

**High-speed Gantry Machines Optimization based on Finite Element Method** Jun. - Sep. 2021
*RA to Associate Professor Haonan Li in the Advanced and Manufacturing Centre at UNNC*

- Strengthened while lightening the machine by adding reinforcing ribs where the stress concentration was and reducing material where the stress was low in Fusion 360.
- Calculated tool nose's x, y, z axis displacement with given load data to identify the needs for strengthening in each direction and added reinforcing ribs to enhance strength to the original level in Fusion 360.
- Redesigned a honeycomb base structure to enable the machine to work in non-foundation environments and reduce machine weight by 10% while improving machining accuracy; drafted two patents application.

**Designed an Electromagnetic Antiphase Motion Energy Harvester** Jun. - Aug. 2021
*Team Leader & RA to Assistant Professor Chung Ket Thein*

- Developed a project plan with the supervisor and facilitated the flow of information between the supervisor and team members through regular meetings.
- Harvested motion energy by transmitting vertical vibration into one-way rotation parallel to the drive shaft; amplified the rotation with gear sets and transformed it into antiphase rotation between the magnet and coil with two coaxial gear sets to improve energy conversion efficiency.

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- Applied Faraday's Law to produce electrical currents by making the coil wires cut through the magnetic field lines; optimized magnet and coil configurations in MATLAB.
- Modeled the device in SolidWorks, 3D printed it, and bought standard parts for assembly.

**Designed and Built a Permanent Magnet Force Measurement Device** Dec. 2020 - Apr. 2021

*RA to Assistant Professor Chung Ket Thein*

- Devised the plan with the supervisor to achieve magnet adjustment to millimeter level by fixing a magnet on each side of the precision slide using the rubber clamp fixated on the slide.
- Measured the force between two magnets in different relative positions with a precision digital scale.

## EXTRACURRICULAR ACTIVITIES

**Boeing Human Factor Project** Dec. 2021

*Volunteer*

- Flew Cessna 172S aircraft (Circuit flying) after attending the flying lesson/instruction given by Professor Devinder Yadav and Boeing staff.
- Provided feedback about the flying experience/learning after completing the flying session.

**Student Personal Development Programme Office** Oct. 2019 - Oct. 2020

*Credit Department Officer*

- Established university-wide rules for security credits, department credits, corporation and organisation credits to ensure reasonableness and fairness.
- Evaluated various credit activity applications in terms of reasonableness, complexity, quantity, and quality before approving or rejecting them.
- Handled students' credit issues and complaints; reviewed students' credit status and arranged resits.

## HONORS

Excellent Graduate of Zhejiang Province
2021-2022 President's Scholarship and Best Performer of the Year (Top 1 in School of Aerospace)
2021-2022 National Scholarship (8 recipients at the university)
2021-2022 UNNC Award for Outstanding Students (Top 2 in School of Aerospace)
2020-2021 President's Scholarship and Best Performer of the Year (Top 1 in School of Aerospace)
2020-2021 Zhejiang Provincial Scholarship (53 recipients in the Faculty of Science and Engineering)
2019-2020 Dean's Scholarship (Top 10% in School of Aerospace)
Second Prize, National University Flight Simulation Championship 2020
The Most Popular Introduction Week Leader of UNNC

## SKILLS

Design & Modeling: AutoCAD, SolidWorks, CATIA 3DEXPERIENCE, Fusion 360, Wing Helper, JavaFoil
Simulation & Analysis: MATLAB, ANSYS
Programming: C/C++, Python, ROS, Linux (beginner), Pycharm, Clion
Basic Software: Microsoft Office (Word, Excel, PowerPoint), Adobe (Photoshop, Lightroom)