

Yali Fan

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Education

National University of Defense Technology, College of Intelligent Science and Technology Changsha, China
Bachelor of Engineering, Artificial Intelligence Sep 2019-Jun 2023

- **Coursework:** Automatic Control, Systems and Control, Image Processing, Basis of AI, Brain Science, Signals and Systems
- **Language:** IELTS-7.5, GRE-322
- **Skills:** Python, C, MATLAB, STM32CUBE, keil
- **Academic Honors:** Learning model (10%), First-class scholarship of NUDT
- **Competition Awards:** The **Finalist** designation of 2022 MCM; The second prize in the western region of the 16th National College Students' Smart Car Competition; The second prize in the 2021 APMCM; National Excellence Award of the 13th National College Student Zhou Peiyuan Mechanics Competition

Nanyang Technological University, the School of Electrical & Electronic Engineering Singapore
Master of Science, Computer Control&Automation(GPA:4.88/5.0) Aug 2023- exp Jun 2024

Publications&Patent

- **Micro expression recognition using pre-trained model and transformer** Mar 2022-Apr 2022
Research assistant accepted by International Conference on Computer Graphics, and Information Visualization
 - Proposed a micro-expression recognition framework combining the Vision Transformer (ViT) network based on the multi head self-attention mechanism with a pre-trained model.
 - Introduced a pre-trained model to solve the problem of small size of datasets.
 - A freezing strategy was adopted to make it suitable for the MMEW data.
 - Achieved an accuracy of 87% on MMEW after 10 epochs training, which is the state-of-the-art accuracy.
- **Rotated Aerial Object Detection Based on Improved YOLOv5 Method** Jun 2022-Aug 2022
Research assistant accepted by 2022 International Conference on Autonomous Unmanned Systems
 - Rotated pictures for data augmentation to make up for the lack of rotation data enhancement in YOLOv5.
 - Designed two selections before and after the data augmentation to reduce computing time and improve the generalization ability of the model.
 - Achieved 67% after 100 epochs of training on YOLOv5 network measured by [mAP@.5:95](#), higher than that of the original size of data set (65.6%) and small size of data (61.5%).
- **Safe Human Dual-Robot Interaction Based on Control Barrier Functions and Cooperation Functions** Jun 2023-Nov 2023
Research assistant submitted to IEEE Transactions on Industrial Electronics (TIE)
 - Presented a distributed control framework that guarantees both human safety and robot cooperation in human dual-robot interaction.
 - Verified the framework using different cooperative tasks and compared it with existing methods via experiments.
- **A Multidirectional Local Resonance Module and Its Vibration Reduction and Isolation Metamaterial Tubular Structure** patent, Mar 2022-Jul 2022
Research assistant
 - Proposed a multiple local resonance module and its vibration reduction and isolation metamaterial tubular structure.
 - Had strong multi-dimensional low-frequency vibration reduction and isolation capabilities in the target frequency band, easy to install and process.

Research Experiences

- **Formation control method and application of multiple unmanned vehicles** Mar 2023-Jun 2023
 - Proposed its own position-angle tracking algorithm "Scatterfit" using control theory, suitable for static scenarios.
 - A two-stage control algorithm called "Stanley-Scatterfit" was proposed for dynamic tasks, which greatly improves control speed and sensitivity while ensuring tracking accuracy.
- **Comprehensive Design of Climbing Robot** May 2022-Jun 2022
 - Coded on Keil to analyze the handle information and used it to control the motor and steering gear.
 - Carried out camera calibration on ROS in combination with lidar. The autonomous navigation is realized by slam.
- **Comprehensive application of ADC and DAC** Oct 2021-Nov 2021
 - Design of A/D conversion circuit based on ADC0809 chip.
 - Writing interrupt handler routine and main program on DOS.

Competition

- **The Mathematical Contest in Modelling** (Finalist Designation) Jan 2022-Feb 2022
- **The 16th National College Students' Smart Car Competition** (Second Prize) Apr 2021- Jul 2021

Leadership

- Leader of brain science and intelligent technology innovation team of NUDT Jul 2022-Now
- Member of the Organizing Committee of NUDT of China "Internet +" competition Apr 2021-Now