Karry Zhang

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PROFILE

My research interests are in Multi-modal Learning (Computer Vision and Natural Language Processing), especially in text-to-image generation. I am passionate in Reinforcement Learning as well. Additionally, I am skilled in Python and knowledgeable in C/C++, with a strong foundation in mathematics, especially in dynamical systems and statistics.

EDUCATION

University of Bristol 2023 QS Rank 61 09/2022 - present
MSc in Engineering Mathematics
- Grades: 70/100 (predicted)
- Key Marks: Learning, Computation and the Brain (71), Uncertainty Modelling for Intelligent Systems (77), Nonlinear Dynamics and Chaos (65)

Hohai University University of 211 Project; 985 Project Innovation Platform 09/2018 - 06/2022
BSc in Robotics Engineering
- Grades: 86.97/100
- Key Marks: Artificial Intelligence Techniques (90), Computational Method (84), Mobile Robot Techniques (93), Human-Computer Interaction (90)

RELATED WORK EXPERIENCE

Engineering Research Center of Dredging Technology, Ministry of Education 09/2020 - 06/2022
Undergraduate Research Assistant | Program Directors: Changyun Wei
- Performed gesture recognition with Shuffle Net in a designed UGV.
- Implemented object detection and control method in a UAV.

Changzhou Guli High-End Equipment Innovation Center 06/2021 - 07/2021
Robotics Software Engineer Intern
- Implemented path planning for SCOUT Mini robot by ROS.
- Utilized RPLIDAR to obstacle avoidance.
- Increased accuracy by Intel RealSense depth camera D435i with OpenCV in C++.

PROJECT EXPERIENCE

Binding Problems for Text-to-image Synthesis. 11/2022 - present
- Improve the performance of text-image generation models in the attribute binding problem.
- Replicate the stable diffusion with high-performance computer and Hugging Face packages.
- Integrate explicit directional information from the input text with the image embeddings.

Scoring Protein-Protein Interactions 01/2023 - 03/2023
- Predicted probability that two proteins can interact by machine learning method.
- Investigated the correlation between energy-based metrics and structure-based metrics.
- Working in a team of 4, I practiced communication skills and cooperation.

Autonomous Landing of UAV for UAV-UGV Cooperation 04/2021 - 06/2022

- Supported by the National Natural Science Foundation of China; the Fundamental Research Funds for the Central Universities.
- Collected a dataset in ROS by OpenCV and traditional computer vision methods.
- Detected the landmark based on YOLOX and altitude estimation method.
- Improved detection accuracy by 4.17% through boosting the dataset with DCGAN.
- Landed the drone on a moving UGV by DDPG.
- Deployed these algorithms in real-world experiment.

Gesture Recognition Based UGV Navigation 03/2021 - 04/2021

- Trained a Shuffle Net to navigate UGV by Gesture Recognition.
- Implemented PID controller and advanced controller in STM32.
- Deployed the model in RaspberryPi.

PUBLICATIONS

[1] Z. Pengpeng, W. Changyun, Z. Kairui, and O. Yongping, "Self-learning approach to control parameter adjustment for quadcopter landing on a moving platform," *CAAI Transactions on Intelligent Systems*, vol. 17, no. 5, pp. 931–940, 2022. DOI: 10.11992/tis.202107040.

AWARDS

Hohai University School Scholarship 05/2021

BRISTOL BIO-HACKATHON First prize 11/2022

team work to create a project with smartwatch

SKILLS

IT Skills

- Programming: proficient in Python, experienced in C/C++, MATLAB, Bash, familiar with MySQL, HTML5, CSS, JavaScript and Vue.
- Deep learning framework: proficient in PyTorch, experienced in TensorFlow1.14.0, PaddlePaddle
- Python libraries: Matplotlib, NumPy, Pandas, scikit-learn, SciPy, xgboost, polars, PyQt5
- Applications: slurm, Git, VS Code, Jupyter, LaTeX, Microsoft Office
- Operating Systems: familiar with Linux (Ubuntu, CentOS), Windows
- Chinese National Computer Rank Examination Grade II (C++) and Grade III (computer network)

Languages

Mandarin Chinese (native), English (IELTS 6.5, Fluent working English), Japanese (Basic)