Guo Lujiale

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EDUCATION

University of Malaya (UM) Sep.2022 – June.2024 (expected)
M.Phil. in engineering science Kuala Lumpur, Malaysia

- Advised by Prof. *CHUAH JOON HUANG* at the Image Processing (VIP) Lab.
- The selected courses and research progress are all A+

Shijiazhuang Tiedao University (STDU) Sep. 2018 – July.2022
B.Sc. in Mechanical Design Manufacture and Automation Shijiazhuang, China

- Average score: 80.64

RESEARCH EXPERIENCE

Unsupervised Feature-Preserving CycleGAN for Fault Diagnosis of Rolling Bearings using Unbalanced Infrared Thermal Imaging Sample Sep. 2022 – Present
M.Phil. thesis supervised by Professor CHUAH JOON HUANG (UM) Kuala Lumpur, Malaysia

- To solve the problem that the data of infrared thermal image of bearing is unbalanced when using machine learning model, the improved CycleGAN network is used to amplify the data robustly. The quality and usability of the amplified image and the final detection accuracy are better than the previous algorithms. The accuracy is improved by 10-20% compared with the previous methods.
- The paper has been submitted to the journal "Expert Systems with Applications" (Under Review) (Q1, IF = 8.5).

Heterogeneous Graph Attention Neural Network for Single Cell Annotations using Multiplex Mode Sep. 2023 – Present
Kuala Lumpur, Malaysia

- A heterogeneous graph attention neural network based on multimodal data for single cell annotation is proposed. This model can construct multiple heterogeneous subgraphs through the multi-omics or multimodal information about single cells, and through the attention mechanism at Node-Level and Path-Level levels.
- The model has been tested in the CODEX Multiplied Imaging B004 dataset, which contains about 248,285 cells, and each cell contains a panel of 47 oligonucleic-barcoded antibodies expression.
- The results accuracy = 0.9102 and weighted F1 score = 0.9101 is better than the best F1 score = 0.8 before. (In Manuscript)

BTFormer: An accurate classification technique of bacteria with deep learning Feb. 2023 – Present
Kuala Lumpur, Malaysia

- A new method of self-attention mechanism is proposed, which can significantly reduce the parameters of neural network and improve the performance of neural network.
- A new cross-connected neural network, BTFormer network, is proposed, which can make different feature maps interact with each other with the help of information interaction module to combine information about bacteria at macro and micro levels.
- A data set containing five kinds of bacteria was collected, including 3384 original images. The network can classify bacteria within a few seconds after collecting bacterial images, which has high accuracy of 98.077%.

ACADEMIC AWARDS AND SCHOLARSHIPS

The third prize of "Chinese college students' engineering training ability competition--UAV"	*2021-2022*
The second prize of "Chinese college students' engineering training ability competition--Automatic Tracking Vehicle" (CETC)	*2021-2022*
The first prize of “Chinese University Student Innovation Capacity Competition"	*2020-2021*
Shijiazhuang Tiedao University "Most Beautiful College Students"Scholarship	*2020-2021*

LEADERSHIP EXPERIENCE

Automatic Tracking Vehicle Team of CETC Sep. 2020 – May. 2021
Captain and Team Member Shijiazhuang, China

- Participate in national competitions on behalf of the whole school, use MATLAB to model the data of vehicle paths, and use mechanical processing knowledge to process and manufacture vehicles.
- Set up a team as a team leader and applied for 20,000 CNY from the school to make Automatic Tracking Vehicle and communicate with other schools.

Engineering Innovation Training Lesson Mar. 2021 – Mar. 2022
Assistant teacher Shijiazhuang, China

- In Industrial Training Center of Shijiazhuang Tiedao University from March 2021 to March 2022, The main responsibilities are assisting the teaching of mathematical modeling, the use of Matlab in the course of "Engineering Innovation Training".

University Students' Science and Technology Innovation Association Sep. 2020 – June. 2021
President Shijiazhuang, China

- Leading more than 100 students to hold and participate in various competitions in the school, and taught mathematical modeling, machinery manufacturing, machine learning and other knowledge.

Chairman of Engineering Training Center for University Students. Mar. 2020 – Mar. 2021
President Shijiazhuang, China

- Responsible for assisting in courses such as mathematical modeling and engineering application.

SKILLS

- *Programming* Matlab, Python {Pytorch, Tensorflow, Pyg, Pandas, Numpy, sklearn}.
- *Tools* LATEX, Linux, Anaconda, Git, Docker, Abode Illustrator.