Haoyu Lu

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Education

Beijing Normal University, Beijing, China 09/2020 – 07/2024 (expected)

B.S. in Computer Science and Technology, School of Artificial Intelligence
GPA: 3.8/4.0, **Rank**: 5/53
Relevant Courses (selected):
Compulsory: Data Structure (95), Principles of Computer Composition (95), Algorithm Design and Analysis (94), Probability Theory and Stochastic Process (93)
Optional: Introduction to Machine Learning (97), Multimedia Technology (93), Introduction to Big Data (95), Programming in JAVA (95)

Experience

Natural Hazards Remote Sensing Lab, Peking University 04/2023 – Present

Research Assistant Advised by: Prof. Xie Hu

- Project **Domain Adaptive Semantic Segmentation of Multi-annual Retrogressive Thaw Slumps** (*paper under review*) was chosen as one of the 2023 Emerging Engineering Interdisciplinary Projects, Peking University, co-advised by Prof. Xie Hu and Prof. Shanghang Zhang
    - Implemented Deeplab V3+ segmentation model integrated with gradient reversal layer and domain discriminator for domain adaptation
    - Achieved an F1 score of 0.829 and a recall rate of 0.934, outperforming CycleGAN and fine-tuning
- Currently working on fine-tuning Segment Anything Model (SAM) for segmentation tasks in remote sensing images

Key Laboratory of Beam Technology of Ministry of Education,
Beijing Normal University 09/2022 – Present

Research Assistant Advised by: Prof. Jianyong Jiang

- Exploring the combination of computer science and medical imaging techniques, especially in fields of Positron Emission Tomography (PET) and Compton imaging
- Implemented models for medical image classification and segmentation from U-net to recent SAM, having gained insights into both the imaging principle and related downstream tasks
- Currently working on physics-based imaging correction using methods of deep learning and solutions to inverse problems with explainable AI

Cannabis "Vaccacine", Beijing Normal University 02/2022 – 11/2022

Leader of Modelling Group International Genetically Engineered Machine Competition

- Established mathematical models to describe the system of biochemical reactions of Cannabis "Vaccacine" based on differential equations, stochastic process and biochemical kinetics, etc.
- Implemented the models and simulated to explore the feasibility and efficiency of our biological pathway
- Discussed with wet-lab fellows to improve experiment design according to simulation results

Stress Detection Platform
Based on Heart Rate Variability, Beijing Normal University 06/2021 – 05/2022

Member Advised by: Prof. Hua Huang

- Chosen as one of 2021 Beijing Undergraduate Research and Innovation Projects
- Implemented denoising and smoothing algorithms to preprocess Photoplethysmography (PPG) signals sampled from a custom wristband, and calculated parameters related to HRV level in time and frequency domain
- Implemented deep learning based classification algorithm on preprocessed, labeled data, achieving great accuracy of 96.48%

Honors and Awards

Silver Medal, Internationally Genetically Engineered Machine Competition (Modelling) 11/2022
1st Prize Scholarship (10%), Beijing Normal University 10/2021, 10/2022
1st Prize, National English Contest for College Students 10/2022
Excellent Student Cadre, Beijing Normal University 10/2022
2nd Prize, Beijing College Students' 'Internet+' Innovation and Entrepreneurship Competition 08/2022
Honorable Mention, Interdisciplinary Contest In Modelling 05/2022
Merit Student, Beijing Normal University 10/2021

Publications

Jiang, Jianyong, Jianlang Hua, Haihao Wang, Ziquan Yuan, Yuan Meng, **Haoyu Lu**, Steven Liu, Yunlai Chen, and Yuan-Chuan Tai. "A virtual-pinhole PET device for improving contrast recovery and enhancing lesion detectability of a one-meter-long PET scanner: a simulation study." *Physics in Medicine and Biology* (2023).

Under Review

Lin, Yiling, Xie Hu, **Haoyu Lu**, Shanghang Zhang, Fujun Niu, Jifu Liu and Yunhuai Liu. "Domain adaptive semantic segmentation of multi-annual retrogressive thaw slumps." (2023)

Activities

Academic Contest Department,
School of Artificial Intelligence, Beijing Normal University 07/2021 – 07/2022
Leader

- Helped organize various school-level contests and academic events
- Hosted seminars with veteran engineers in industry, prestigious professors and high-level contestants in related competitions like ACM-ICPC
- Organized interesting, rewarding activities aiming at promoting professional growth, e.g., daily coding

Skills

Programming: proficient in

- Programming languages: C/C++, Python and MATLAB
- Deep learning frameworks: PyTorch and TensorFlow
- Development environment configuration on Linux platforms

Languages:

- English - Fluent
    - TOEFL: 108 (reading 29, listening 26, speaking 26, writing 27)
    - GRE: 327+3.5 (verbal 158/170, quantitative 169/170, writing 3.5)
    - CET-6: 605
- Mandarin - Native