Pengyuan Han

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EDUCATIONAL BACKGROUND

09/2020-06/2024 **Chengdu University of Information Technology**
Subject: **Electrical Information Science and Technology**
Academic Honours:

- The Honorary Title of "Top Ten Young Students" in May 2022
- The Honorary Title of "Star of Mass Entrepreneurship and Innovation" in May 2022
- The Fifth Changhong Mass Entrepreneurship and Innovation Fund of CUIT in December 2021
- The Sixth Changhong Mass Entrepreneurship and Innovation Fund of CUIT in December 2022
- Special Scholarship and Merit Student of CUIT in October 2021 and November 2022
- The Honorary Title of PaddlePaddle Development Expert, approved and awarded by the National Engineering Laboratory of Deep Learning Technology and Application and the New Generation Artificial Intelligence Industrial Technology Innovation Strategic Alliance (aitisa), DLF AI & DATA and Baidu PaddlePaddle in August 2021

RESEARCH PROJECTS

- ***Topology-Embedded Temporal Attention for Fine-Grained Skeleton-Based Action Recognition***

In recent years, graph convolutional networks (GCNs) have been extensively applied in numerous fields, demonstrating strong performances. Although existing GCN-based models have extraordinary feature representation capabilities in spatial modelling and perform exceptionally well in skeleton-based action recognition, they work poorly for fine-grained recognition. The key issue involves tiny distinctions between multiple classes. To address this issue, we propose a novel module named the Topology-Embedded Temporal Attention Module (TE-TAM). Through embedding the temporal-different topology modelled with local area skeleton points in spatial and temporal dimensions, The TE-TAM achieves dynamic attention learning for the temporal dimensions of distinct data samples, capturing minor differences among intra-frames and inter-frames, making the characteristics more discriminating, and increasing the distances between various classes. To verify the validity of the proposed module, we inserted the module into the GCN-based models and tested them on FSD-30. Experimental results show that the GCN-based models with TE-TAMs outperformed the property of previous GCN-based models.
Published in Applied Sciences; 2022, 12(16), 8023; https://doi.org/10.3390/app12168023
Authors: Pengyuan Han; Zhongli Ma; Jiajia Liu

- ***Protein Structure Predicts Enzyme Activity***

We collated Km and Kcat data from the BRENDA database and the literature to form a preliminary dataset. With the publicly available dataset, the team collated negative example data of enzymes and substrates, and matched the enzyme sequences with the structures predicted by AlphaFold to form an enzyme activity dataset containing enzyme structure data. The enzyme activity values were ranked by the natural breakpoint method, and the enzyme activity classes were specified for classification and prediction. Based on the transformer model, the enzyme activity was predicted by considering the enzyme sequence, enzyme structure and compound data, and the results were evaluated.
Link of the project: https://deecamp.com/#/achievementsDetails?id=64
Members: Dongliang Liu; **Pengyuan Han**; Yaping Chen; Ren Zhen; Hang Wu

- ***Robot Automatic Recognition and Hitting System Based on Computer Vision***

Based on computer vision, target pose estimation, filtering algorithms, and projectile motion models, we construct an algorithmic framework for automatic recognition and targeting. Based on this framework, we tested and optimized different target detection, pose estimation and filtering algorithms, which are finally validated on infantry, sentry and

hero robots in the RoboMaster2022 competition.

Link of the project: https://aistudio.baidu.com/aistudio/projectdetail/5475954

Members: Pengyuan Han; Mingyuan Cheng; Bingling Huang

CAMPUS ACTIVITIES

06/2022-08/2022 **DeeCamp 2022 (AI + Life Science)**

Group Research Topic: **Protein structure predicts enzyme activity**

- The competition was sponsored by the Innovation Factory and Institute for AI Industry Research, Tsinghua University
- Won the first prize in the preliminary competition and the winning prize in the final competition
- Won the Special Award for the Individual Spirit of Discovery

03/2022-06/2022 **AntigenWeChatbot Project**

- This project aimed to protect Shanghai residents from the epidemic
- Preside over the development of the Antigen Detector sub-project to detect whether the COVID-19 kit is positive, and to assist the community in screening
- Link of the project: https://aistudio.baidu.com/aistudio/projectdetail/3965485?contributionType=1

12/2021 **Paddle Hackathon 48H Coding Party Event**

- Led a team to complete coding the software named programmer's posture correction artifact
- Win the Open-Source Contribution Award and Popularity Award
- Link of the project: https://aistudio.baidu.com/aistudio/projectdetail/3229586?contributionType=1

CERTIFICATES & AWARDS

- The Honorable Mention Prize of 2022 ShuWei Cup IMCM in January 2023
- The First Prize in the 3V3 rivalry match of RoboMaster 2022 Mecha Master College League Tournament in November 2022
- The Third Prize in Infantry match (Automatic Infantry) of RoboMaster 2022 Mecha Master College League Tournament in November 2022
- The First Prize of National Mathematical Modeling Contest for College Students (Sichuan) in October 2022
- The Third Prize in National Final Contest of the 15th China University Student Computer Design Competition AI Challenge in August 2022
- The Third Prize of the Finals of 2022 International Autonomous Intelligent Robot Competition in August 2022
- The Second Prize of Sichuan Region of the 8th Statistical Mathematical Contest in Modelling in August 2022
- The First Prize of the Preliminary Competition and the Winning Prize of the Final Contest in DeeCamp2022 in August 2022
- DeeCamp2022 Award for Most Spirit of Discovery in August 2022
- The Second Prize in Regional Selection of the 15th China University Student Computer Design Competition Artificial Intelligence Challenge in July 2022
- The First Prize in the Eastern division of the 2022RoboMaster National College Student Robotics Competition in July 2022
- The Second Prize of the 13th Lanqiao Cup Python Programming Competition in Sichuan in May 2022
- The First Prize in the 19th 'Wuyi' Mathematical Contest in Modeling in May 2022
- The Second Prize in the 2021 China Robot Competition and RoboCup China General Service Robot Project in April 2022
- The Third Prize of the Supermarket Shopping Robot Project in the 2021 China Robot Competition and RoboCup China Competition in April 2022
- The Second Prize of the 2021 Asia-Pacific Mathematical Contest in Modelling in December 2021
- The Open-Source Contribution Award and Popularity Award in the 2021 Paddle Hackathon 48H Coding Party Event in December 2021

- The 11th Place (Top 0.3%) Figure Skater Bone Point Action Recognition Problem in 2021CCF Big Data and Computational Intelligence Competition in December 2021
- The First Prize in the Western Division Contest and the Third Prize in the National Final Contest of the 4th National College Students Embedded Chip and System Design Competition in October 2021
- The Excellence Award (36th/top 1%) in the 3rd IKCEST Belt and Road International Big Data Competition & The 7th Baidu & Xi 'an Jiaotong University Big Data Competition in September 2021
- The Second Prize in The Southern Division Contest and the Third Prize in The National Final Contest of the 16th National Intelligent Car Competition for College Students in August 2021
- The Third Prize in the National Final Contest of the 10th China Software Cup National University Student Software Design Competition in August 2021
- The Third Prize in the National Final Contest of the 2nd Aerospace Cup Mobile Robot AI Innovation Technology Challenge in August 2021
- The Second Prize in National English Competition for College Students (NECCS) in May 2021

SKILLS & HOBBIES

Languages: Fluent English (CET 4&6); Native Mandarin

Computer: Proficient in Python, LaTeX, Adobe IIIustrator, Microsoft Excel, Word, and PowerPoint

Hobbies: Running, Badminton, Table Tennis, Tennis