WEIYU SUN

Email: weiyusun@smail.nju.edu.cn

Personal website: https://swy666.github.io/index.html

EDUCATION EXPERIENCE

Nanjing University   *Bachelor 2015.9-2019.6*
Electronic Engineering & Communication Engineering
selected high-scored courses:
Computing Method 98/100, C++ programming 93/100

Nanjing University   *Master 2019.9-2022.6*
Electronic Engineering & Medical Engineering
selected high-scored courses:
Matrix theory 96/100

INTERNSHIP&WORKING EXPERIENCE

Carnegie Mellon University   *Research Internship 2021.7-2021.9*
Computer Science & Bioinformatic Engineering   *Tutor: Pro. Robert F.Murphy*
• Investigation on applying efficient active learning method to boost the training of protein-drug reaction result prediction matrix.
• From perspective of data distribution, according to the property of matrix-form data structure, adjusting the configuration of data to fit the RBF kernel based Beysian Optimization method & random forest regression method based on available sampling data points when training. As a result, combined with traditional active learning strategy, the training process via active learning becomes more efficient, with about 25% speed improvement to reach the same predict precision. Code can be found in https://github.com/SWY666/Gifts-for-Pro.Murphy.
• Based on experiment results, published them as my first paper on EIECT 2021, and promised letter of recommendation.

Pennsylvania State University   *Research Internship 2022.6-hitherto*
Computer Science & Trustworthy Altifical Intelligence   *Tutor: Associate Pro. Jinghui Chen*
• Investigation on effective and less constrained backdoor & poison attack strategy on self-supervised learning method.
• Reimplement classical backdoor & poison attack and defence strategy, conclude that there exists limitation for their effective working, such as the demanding scale of pattern (defend) and dependence on the knowledge of label information in datasets (attack & defend).
• Applying min-min optimization to alternatively train trigger & poison to generate more robust attacking pattern. Currently gain about 10% attack success rate enhancement on BYOL and MoCo (currently reported best attack success rate), and without the necessity to stick triggers on same category.
• Due to loss function's mechanism of MoCo, which results into attack success rate droping during the downstream training on clean datasets, attempt to apply gradient matching strategy to brew attack patterns to solve this problem.
• Still ongoing, gain the acknowledgement of my Internship tutor, with **return offer** and letter of recommendation.

Affiliate workshop of Nanjing University, Zerorui   *Algorithm researcher 2020.7-2022.6*
Remote Video Based Biological signal Extraction   *Tutor: Associate Pro. Ying Chen, Pro. Yun Ge*
• Investigation on video-based remote heart rate detection method. Design relative algorithm and corresponding engineering realization.
• Teamwork with other team members (mainly focus on the development of physiological signal extraction algorithm), published online functional platform http://sass.zerorui.cn/#/home. It can

recognize registered users through webcams and report their current heart rate & other health indicators, then save them into database using Mysql.

• Also implement offline UI product by myself on windows and linux operation system using python and cython, code can be found in https://github.com/SWY666/rPPG_UI_interface.

• Training related heart rate estimation end-to-end network structure demands on forms of dataset, due to the physiological delay between label waves and real faical heart rata signal. design special label representation method to conquer such defect of datasets and lead to convenient and efficient network training. Moreover, proposed method can reach the **SOTA** remote heart rate prediction precision on mostly used dataset. Work has been submitted to AAAI 2023 and under review, also published corresponding patent, code can be find on https://github.com/SWY666/BYHE.

PUBLICATION

AAAI 2023 (Under review)
lead author
"BYHE: A Simple Framework for Boosting End-to-end Video-based Heart Rate Measurement Network"
Source Code: https://github.com/SWY666/BYHE
Arxiv Link: Plan to publish after review step 1, contact me if interested.

EIECT 2021
lead author
"A recessive active learning method: enhancing the performance of predict models by adjusting the structure of data space"
Proc. SPIE 12087, International Conference on Electronic Information Engineering and Computer Technology (EIECT 2021), 120871W (13 December 2021)
Source Code: https://github.com/SWY666/Gifts-for-Pro.Murphy

CHINA PATENT
lead author
"A Method of Image Classification Based on SCCNN Network"
No.2020115132992

CHINA PATENT
lead author
"A Deep Learning Remote Heart Rate Measurement based on faical video"
No.2022051901560520

SELECTED AWARD

2021 Microsoft Innovation Cup Global Student Technology Competition
the Second Prize in Jiangsu Province

2018 Scholarship of School of Electronic Science and Engineering
top 20%

SKILL

programming skill, from mainly used to less used
Python, C++, Matlab, html, Rust
Language skill
GRE 325, TOFEL 100