Pengwei Yang

Updated August 9, 2023

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Research interests

Machine Learning, Computer Vision, Crowdsourcing Energy Service, IoT

Education

The University of Sydney Sydney, Australia

Master of Information Technology (Research Pathway) Jan 2022 – Present
Mentor: Professor Athman Bouguettaya. *WAM: 79.9.*
Main course: Machine learning and data mining, deep learning, natural language processing, advanced machine learning, computer research method.

Chengdu University of Information Technology Sichuan, China
Bachelor of Electronic Information Science and Technology Sep 2016 – Jul 2020
Mentor: Dr. Qian Wu. *WAM: 81.*

Publication

Energy Loss Prediction in IoT Energy Services (Core A Conference)
Status: Got accepted.
Pengwei Yang, Amani Abusafia, Abdallah Lakhdari, Athman Bouguettaya.
Conference Proceeding of the International Conference on Web Services (ICWS), 2023.

Towards peer-to-peer sharing of wireless energy services (Core A Conference)
Status: Published by Springer, DOI.
Pengwei Yang, Amani Abusafia, Abdallah Lakhdari, Athman Bouguettaya.
Conference Proceeding of the 20^{th} International Conference on Service-Oriented Computing (ICSOC), 2022.

Monitoring Efficiency of IoT Wireless Charging (Core A* Conference)
Status: Published by IEEE, DOI.
Pengwei Yang, Amani Abusafia, Abdallah Lakhdari, Athman Bouguettaya.
Conference Proceeding of the 21^{st} International Conference on Pervasive Computing and Communications (PerCom), 2023.

Technical Reports

Contaminated Images Recovery by Implementing Non-negative Matrix Factorisation
arXiv:2211.04247, 2022.
Establishment of Neural Networks Robust to Label Noise
arXiv:2211.15279, 2022.

Techniques in Deep Learning: A Report
http://dx.doi.org/10.13140/RG.2.2.30086.65602/1
Multimodal in Multi-Label Classification: A Report
http://dx.doi.org/10.13140/RG.2.2.29898.54722

Research Experience

Energy loss prediction in crowdsourcing energy service (SCSLab)
Mentor: Professor Athman Bouguettaya Jul 2022 – Present
Estimating energy loss derived from the wireless power transfer process by implementing state-of-the-art machine learning algorithms. Proposed a wireless energy sharing platform that extended one wireless energy sharing application to enable near-field wireless power transfer. Demonstrated the feasibility and stability of the proposed platform. Completed energy increase estimation by making use of XGBoost, Neural Networks, and some efficient transformer-based algorithms to make predictions at time-series data.
Currently have published one conference paper at **PerCom (Core A*)**, one conference paper at **ICSOC (Core A)**, and one conference paper that got accepted by **ICWS (Core A)**. Planning to extend the aforementioned research to IEEE Transaction on Services Computing (TSC).

Skills

Programming:
Proficient in: Python (PyTorch, Ski-learn, Pandas, NumPy, etc).
Familiar with: PostgreSQL, C.
English: IELTS 6.5
Deep learning: Familiar with the concepts of classic networks such as ResNet and Transformer, as well as their construction using PyTorch; proficient in manual implementation of optimizers such as Adam; knowledgeable in neural network training and parameter tuning; acquainted with Neural Architecture Search (NAS) tasks.
Machine learning: Familiar with traditional machine learning algorithms (classification, regression, clustering, dictionary learning, etc.), proficiency in transfer learning, reinforcement learning, causal inference, and multitask learning theories is demonstrated. Experience in deploying robust machine learning algorithms (such as non-factor matrix decomposition and robust loss function applications in neural networks) and implementing and tuning Transformer-based temporal models is also present.
Natural Language Processing: Familiar with word vector models (Word2Vec, FastText, GloVe), sequence models (RNN, LSTM, GRU, Informer), text processing tasks (lemmatization, stemming, etc.), Part-of-Speech tagging (PoS), dependency parsing, named entity recognition (NER), question-answering tasks (QA), etc.

Other Experience

1. Served as a session chair in 2023 IEEE International Conference on Web Services (Core A) in July 2023. More details can be found at https://conferences.computer.org/icws/2023/program/ under the session name: CWS_CON_15.

2. Joined the Sensor, Cloud, and Service Lab (SCSLab) at the University of Sydney in the second semester of 2022 (July 2022 - Present).

3. Participated in the algorithm robustness research project at the Trustworthy Machine Learning Lab at the University of Sydney (August 2022 - March 2023). The output includes two papers, which can be found at https://arxiv.org/abs/2211.15279v3 and https://arxiv.org/abs/2211.04247v4.

4. Participated in the SCSLab summer research project at the University of Sydney, focusing on the deployment of machine learning algorithms in IoT services (December 2022 - February 2023).

5. Joined the consultant group for the Natural Language Processing (COMP5046) course at the University of Sydney in the first semester of 2023 (February 2023 – June 2023).

6. Contributed to the deep learning research project at the Deep Learning Lab at the University of Sydney, under the guidance of Professor Xu Chang (March 2023 - May 2023). The output includes two technical reports, which can be found at http://dx.doi.org/10.13140/RG.2.2.30086.65602/1 and http://dx.doi.org/10.13140/RG.2.2.29898.54722.

7. Received the Higher Degree Research - Research Activity Support Fund (HDR-RASF) at the University of Sydney twice, totaling AUD 5000 (February 2023, May 2023).