Pengwei Yang

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Research interests

Machine Learning, Computer Vision, Crowdsourcing Energy Service, IoT

Education

The University of Sydney   Sydney, Australia

MA in 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
BA in 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, *full research paper.*
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, *workshop paper.*
Pengwei Yang, Amani Abusafia, Abdallah Lakhdari, Athman Bouguettaya.
Conference Proceeding of the 20th International Conference on Service-Oriented Computing (ICSOC), 2022.

Monitoring Efficiency of IoT Wireless Charging (Core A* Conference)
Status: Published by IEEE, DOI, *workshop paper.*
Pengwei Yang, Amani Abusafia, Abdallah Lakhdari, Athman Bouguettaya.
Conference Proceeding of the 21st 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 demo paper at ICSOC (Core A), one demo paper at PerCom (Core A*), and one full research 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.

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.