Xiangjian Jiang

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EDUCATION

University of Cambridge   **Cambridge, UK**
Master of Philosophy in Advanced Computer Science   Oct. 2022 - Jul. 2023
- **Grade: Distinction**
- Dissertation: "ProtoGate: Prototype-based Neural Networks with Local Feature Selection for Tabular Biomedical Data"
- Relevant Coursework: Representation Learning on Graphs and Networks, Interaction with Machine Learning, Advanced topics in Machine Learning, Theory of Deep Learning, Machine Learning and the Physical World

Beihang University (Project 211 & 985 University)   **Beijing, China**
Bachelor of Engineering in Computer Science and Technology   Sept. 2018 - Jun. 2022
- **Grade: 92.98 (Ranking: 2/201)**
- Awards: National Scholarship (Top 0.1%), Outstanding Graduation Dissertation (Top 1%), Dean's Honors List for 2018-2021 academic years (Top 1%), Scholarship of Academic Excellence for 2018-2021 academic years (Top 3%)
- Relevant Coursework: Optimization in Computer Engineering (100/100), Probability and Statistics (98/100), Big Data Analysis (99/100), Operating System Project (99/100), Software Engineering (98/100)

PUBLICATIONS

- **Xiangjian Jiang**, et al. "ProtoGate: Prototype-based Neural Networks with Local Feature Selection for Tabular Biomedical Data.", accepted by ***ICML 3rd Workshop on Interpretable Machine Learning in Healthcare (IMLH2023)***.
- **Xiangjian Jiang**, et al. "Multi-view Human Body Mesh Translator.", arXiv preprint arXiv:2210.01886 (2022).
- **Xiangjian Jiang**. "Research on Computer Intelligent Risk Prediction Model and Identification Algorithm with Machine Learning.", accepted by ***2021 IEEE International Conference on Emergency Science and Information Technology (ICESIT2021)***.
- Renshuai Tao, Yanlu Wei, **Xiangjian Jiang**, et al. "Towards Real-World X-Ray Security Inspection: A High-Quality Benchmark and Lateral Inhibition Module for Prohibited Items Detection.", accepted by ***International Conference on Computer Vision 2021 (ICCV2021)***.
- Bonan Li, Yinhan Hu, Xuecheng Nie, Congying Han, **Xiangjian Jiang**, et al. "DropKey for Vision Transformer.", accepted by ***Conference on Computer Vision and Pattern Recognition 2023 (CVPR2023)***.

RESEARCH EXPERIENCES

Interpretable Local Feature Selection Based on Deep Learning   **Cambridge, UK**
Research Assistant, **Supervisor:** *Prof. Mateja Jamnik, University of Cambridge*   Dec. 2022 – Jun. 2023
- **Algorithm Design:** Proposed ProtoGate, a novel method which addresses the challenge of biomedical data by achieving local feature selection and explainable predictions with a global-to-local feature selector and a prototype-based classifier
- **Codebase Construction:** Implemented a pipeline with PyTorch Lightning and TensorFlow to evaluate ProtoGate and 12 benchmark methods on synthetic and real-world datasets and quantitatively demonstrated that ProtoGate outperforms existing methods in both predictive performance and feature selection sparsity
- **Academic Contribution:** Accomplished distinction in MPhil project assessment, and presented the research outcomes at the ICML 2023 workshop

Human Body Mesh Reconstruction Based on Deep Learning   **Beijing, China**
Research Assistant, **Supervisors:** *Prof. Si Liu (Beihang University) and Dr. Xuecheng Nie (Meitu Inc.)* Dec. 2021 - Sept. 2022
- **Dataset Standardization:** Established an efficient pipeline to process various human body mesh datasets, including HUMBI, Human3.6M and 3DPW, for unified APIs on the transformation of images and annotations
- **Algorithm Design:** Proposed a novel framework (MMT) composed of Vision Transformers to fuse multi-view features and recover human body mesh in a single-forward manner, outperforming the pre-trained SOTA method by 28.8% on the HUMBI dataset when training MMT from scratch with specially designed Cross-view Alignment task

Data Mining and Credit Risk Prediction Based on Machine Learning   **Beijing, China**

Research Assistant, **Supervisor:** *Associate Prof. Yunqin Zhong, Chinese Academy of Sciences*   Jul. 2021 - Sept. 2021

- **Data Mining:** Conducted pre-processing on 200,000 records, extracted an 11-dimensional loaner attribute vector and mined analytical patterns illustrating the correlation between previous actions and default behaviour
- **Default Prediction:** Designed and realized a pipeline system fed with borrower's credit records and financial situation and used pandas, NumPy and sklearn to implement a Random Forest Regressor, improving AUC from 0.70 to 0.84 of alerting potential breach of contract

Dangerous and Small Object Detection Based on Deep Learning   **Beijing, China**

Research Assistant, **Supervisor:** *Prof. Xianglong Liu, Beihang University*   Aug. 2020 - Jul. 2021

- **Dataset Construction:** Collated RGB X-ray image data of 102,928 prohibited items, masked personal information and completed the visual analysis on occurrences of objects with Python
- **Method Innovation:** Proposed a new object detection method named Lateral Inhibition Module (LIM), achieving SOTA performance, at least 1% mAP higher than advanced algorithms like YOLOv5 in X-ray security inspection
- **Performance Evaluation:** Built and trained the deep learning models including SSD and FCOS with self-taught PyTorch and conducted test procedure of IO format, model architecture and runtime on the whole system

PROJECT EXPERIENCES

Modern Machine Learning Algorithms and Applications

Software Developer and Maintainer   May. 2021 - Oct. 2021

- Used Git and PyTorch to construct an open-source repository with 15+ real-world machine learning algorithms and applications like semi-supervised image classification and anime generation with GAN
- Summarized 30+ commonly used programming practices in machine learning and prepared theoretical notes and technical tutorials for interested learners
- Code: *https://github.com/SilenceX12138/Machine-Learning-Theory-and-Application*

MIPS Microsystems

System Designer and Software Developer   Sept. 2019 - Dec. 2020

- Realized a five-stage pipeline microprocessor in Verilog that supports 70+ instructions and handles basic exceptions or interrupts according to MIPS principles
- Improved an operating system for MIPS-based machines with Linux kernel to support virtual memory, process management and system call via C/C++
- Designed and implemented a multi-pass compiler via C/C++ with standard optimization algorithms, including copy propagation, for C0 programming language and MIPS assembly language
- Code: *https://github.com/SilenceX12138/MIPS-Microsystems*

SELECTED AWARDS AND HONORS

- First Prize of the 29th "Feng Ru Cup" Competition of Innovation (2019, first author and professional top 1%)
- Second Prize of the 31st "Feng Ru Cup" Competition of Academic and Technological Works (2021, first author and professional top 3%)
- Third Prize of the 11th "Blue Bridge Cup" National Software and Information Technology Professionals Competition in C++ (2020, awarded by China Software Industry Association)

SKILLS AND INTERESTS

Language: Mandarin (native), English (IELTS: 8.0, TOEFL: 108)

Technology: Proficient in Python (PyTorch, sklearn, pandas), Java, C/C++, MATLAB, HTML/CSS, SQL, Verilog, Latex, PS

- Certificated with NIEH Industrial and Information Application Talent Assessment (3D model Design), CCF CSP Certified Software Professional (C/C++ and Python)

Interests: Electric Keyboard (Level-9), Voluntary Work, Hiking, Photography