MINGXUAN(JIM) LI

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EDUCATION

Brown University *Sept 2019 - June 2021(Expected)*
ScM in Computer Science, GPA: 4.0/4.0
Core Courses: Learning and Sequential Decision Making, Introduction to Robotics, Reintegrating AI

Hong Kong University of Science and Technology(HKUST) *Feb 2018 - June 2018*
Exchange Student in Computer Science, Major GPA: 4.0/4.3
Core Courses: Intro to Bayesian Networks, Data Visualisation, Database Management System

Beihang University *Sept 2015 - June 2019*
B.S in Computer Science and Technology, Overall GPA: 3.7/4.0
Core Courses: Compiler Theory, Operating System, Image Processing and Pattern Recognition

RESEARCH INTEREST

Reinforcement Learning, Efficient Planning, Adversarial Defense.

PUBLICATIONS

- **Interpretability is a Kind of Safety: An Interpreter-based Ensemble for Adversary Defense - KDD 2020 (To Appear)** *Jingyuan Wang, Yufan Wu, Mingxuan Li, Xin Lin, Junjie Wu, Chao Li*
- **Replication of "When to Trust Your Model: Model-Based Policy Optimization" - Preprint** *Mingxuan Li*, Xiaoyu Jiang*, Qiuxuan Chen*, Shiyi Han*, Jingyan Dong*, Ruochen Zhang**
- **Detecting and Recovering Adversarial Examples: An Input Sensitivity Guided Method - Priprint** *Mingxuan Li, Jingyuan Wang, Yufan Wu, Shuchang Zhou, Chao Li*

SELECTED RESEARCH EXPERIENCE

Learning and Planning with Hierarchical Options Model Dec 2019 - Current
Advisor: Prof. Michael L. Littman, Dr. Sam Saarinen *Robotics Lab, Brown University*

· Attempted to design a hierarchical learning framework using temporal abstractions of actions (options) aiming at helping agents perform better in complex real dynamics with high data efficiency;
· Attempted to design an automatic scheme to extract hierarchical structures from raw environment observations instead of hand crafted;
· Attempted to analyse algorithm time complexity and convergence theoretically.

Robust Adversaries Detection and Recovery Mar 2019 - Nov 2019
Advisor: Prof. Jingyuan Wang, Dr. Shuchang Zhou *Megvii CV Group, Beihang U*

· Proposed an input sensitivity based adversarial examples detection and recovery pipeline with an average of 96% detection accuracy and high robust classification accuracy against famous adversaries;
· Provided an optimization view of adversarial examples' intrinsic properties that can differentiate them from normal inputs;
· Significantly increased attacking cost and decreased attacking success rate when combining the detector and the rectifier together;

· Formed a research paper as first author under review.

On Neural Network Interpretability Aug 2017 - June 2018
Advisor: Prof. Jingyuan Wang *Big Data Intelligence Group on SmartCity, Beihang U*

· Proposed an algorithm called Tree2Net extracting rules from decision trees to initialize a neural network (tree to network) and reverse the procedure to find out what the network has learnt (network to tree);
· Independently built the self-defined network structure with the most basic operator;

Unsupervised Multi-Modal Neural Image Style Transfer May 2018 - Aug 2018
Advisor: Dr.Xinlei Pan *Berkeley Artificial Intelligence Research Lab, UC Berkeley*

· Proposed a model in combined use of Bayesian GAN and Cycle GAN;
· Achieved multi-modal image generation and unsupervised leaning simultaneously;
· Attempted to apply Stochastic Hamiltonian Gradient Monte Carlo sampling to the network parameters.

''BDCI & Alibaba Cloud Cup'' Data Mining Competition Sept 2017 - Nov 2017
Advisor: Prof. Jingyuan Wang *Big Data Intelligence Group on SmartCity, Beihang U*

· Worked on mobile phone user localisation in a shopping mall using shop ID and WIFI information;
· Gained a 30+ ranking improvement after combining a modified neural-network architecture proposed in a paper entitled Deep Neural Networks for wireless localization in indoor and outdoor environments published in Neurocomputing, Vol. 194, June 2016;
· Led a 4-member team and achieved the national rank of 130/2845 (4%).

INTERNSHIP EXPERIENCE

Turing Microbe Co.,Ltd Mar 2019 - July 2019
Advisor: Prof. Wei Xu(IIIS, Tsinghua U) *Computer Vision Research Intern, R&D Department*

· Analysed over 30,000 cases of gynaecological diseases data with T-SNE and unsupervised deep clustering techniques to give doctors insights on new taxonomy for Bacterial Vaginal(BV) diagnosis;
· Used StyleGAN to generate realistic and highly diverse BV images for training young doctors;
· Highly recognised by Prof. Qinping Liao, the chairman of Chinese Medical Doctor Association, gynaecology branch, for insightful data analyse and practical application value of the image generation pipeline.

Wealth Engine Technology Co., Ltd Aug 2017 - Jan 2018
Advisor: Prof. Changle Lin(IIIS, Tsinghua U) *Machine Learning Engineer, R&D Department*

· Analyzed real-world stock and fund investment log to construct better investment strategy;
· Used random forest/Xgboost to build a customer churn prediction system, which is still in use;
· Used linear regression and regression tree to price financial products for different customer group.

SELECTED PROJECTS

PiDrone: An autonomous drone using Raspberry Pi Sept 2019 - Dec 2019
Course Project *Brown University*

· Built a drone equipped with Raspberry Pi from scratch under the guidance of online manuals;
· Implemented core algorithms to enable the drone to fly, including PID controller, speed control with optical flow, state estimation with unscented Kalman Filter and position control with SLAM;
· Got a solid grasp of foundations of robotics and probabilistic control theory.

JPEG-2000 Standard Image I/O Pipeline May 2019 - June 2019
Personal Side Project *Beihang U*

- Implemented 2D-FastDCT and 2D-FFT in JAVA;
- Analysed JPEG-2000 ISO standard and implemented the whole I/O process including image header information extraction without using any external JAVA image processing packages;
- Provided a visual interface for previewing the processed image along with its grey scale distribution.

SKILLS

Computer Languages	JAVA, Python, C/C++, MATLAB, SQL
Software & Tools	LaTeX, TensorFlow, Pytorch, PowerPoint

SELECTED COURSES

Mathematical Analysis for Engineering(I)	98 (Top 1%)
Discrete Mathematics(I)	99 (1/218)
Advanced Algebra for Engineering	95 (Top 5%)
Introduction to Machine Learning	100 (1/162)
Data Visualisation	A+ (1/86)
Introduction to Bayesian Networks	A- (Graduate Level)
Image Processing and Pattern Recognition	100 (1/65)