Jiaqing Xie

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EDUCATION

University of Edinburgh, Scotland, UK *Sept 2019 – May 2022*

BEng with honors in Electronics and Computer Science (Joint Degree), Overall GPA: *3.94 / 4.00, expected first class*
Supervisor: Prof. Siddharth Narayanaswamy, Co-supervisors: Tuan Anh Le and Eli Bingham

Huazhong University of Science and Technology, Wuhan, China *Sept 2017 – Jul 2019*

BEng in Electrical Engineering, Overall GPA: *3.72 / 4.00, Transferred*
Supervisor: Prof. Xinsheng Wang in National Lab for Optoelectronics

Core Courses: Introduction to Computer Systems | Learning | Introduction to Algorithms and Data Structures | Informatics Large Practical | Introductory Applied Machine Learning | System Design Project | Computer Communication and Networks | Introduction to Databases| Natural Computing | Digital System Design | Analog Mixed Signal Laboratory | Electromagnetics

RESEARCH INTERESTS

Machine Learning, Graph Neural Networks, Computational Biology, Graphical Models

PUBLICATIONS AND PREPRINTS

Jiaqing Xie, Rex Ying. Fea2Fea: Exploring Structural Feature Correlations via Graph Neural Networks. *Proceedings of ECML-PKDD workshop track* 2021 **(oral)**

Hong yuan Dong*, **Jiaqing Xie***, Zhi Jing, and Dexin Ren. Variational Autoencoder for Anti-Cancer Drug Response Prediction. *In AI for Public Health Workshop, International Conference on Learning Representations (ICLR) 2021* **(poster)**

Jiaqing Xie, Haoyang Li, Chuting Li, Jingsi Zhang, Maohui, Luo. Review on occupant-centric thermal comfort sensing, predicting, and controlling. *Energy and Buildings)*, 110392. 2020 *(IF = 5.879)*

Maohui Luo, **Jiaqing Xie**, Yichen Yan, Zhihao Ke, Peiran Yu, Zi Wang, and Jingsi Zhang. Comparing machine learning algorithms in predicting thermal sensation using ASHRAE Comfort Database II. *Energy and Buildings*, *210*, 109776. 2020 *(IF = 5.879)*

RESEARCH EXPERIENCES

Improved Autoguides for Probabilistic Programs *Apr 2021 – present*

Student Researcher, University of Edinburgh| Advisor: Prof. Siddharth Narayanaswamy, UoE

- ✧ Exploring inverse structure of graphical models with Automatic Differentiation Variational Inference(**ADVI**).
- ✧ Digging into materials about inverse dependencies of graphical models and implemented initial tests about **ADVI** with **Pyro**.
- ✧ Taken as my honor year project and in progress.

Exploring Structural Feature Correlations via Graph Neural Networks *May 2020 – Jun. 2021*

Research Assistant, Stanford | Advisor: Rex Ying, incoming assistant professor at Yale

- ✧ Reviewed Stanford CS224W course and project papers to establish knowledge of GNN and find innovation of improvement.
- ✧ Developed an innovative ***GNN*-based** framework on predicting graph structural features mutually to explore the potential correlation between features, aiming to filter redundant structural features and explore the expressive power of GNN.
- ✧ Implemented Fea2Fea-single to achieve feature correlation matrix by graph neural networks. Used the correlation matrix achieved by GNN to perform Fea2Fea-multiple. Generalized it on the synthetic datasets and added irredundant features on real-world applications (*ENZYMES, PROTEINS* and *NCI1*) which improved the average accuracy by approximately 4%.
- ✧ Proposed, designed Fea2Fea and wrote the paper independently. Paper will be published in proceedings of ECML-PKDD workshop.

Anti-Cancer Drug Response Prediction with Variational Graph Autoencoders *Jul. 2020 – Sept. 2020*

Research Assistant, MIT | Advisor: Prof. Manolis Kellis, MIT CSAIL lab

- ✧ Rectified Junction Tree VAE and proposed GeneVAE to extract latent representation for anti-cancer drug structures and cancer gene expressions correspondingly, concatenated them accordingly with the importantly cancer-indicated gene filter (**CGC**).
- ✧ Implemented experiments to show that our model preforms better than baseline supervised machine learning models on predicting **IC50**, as well as on drug molecule generation tasks based on the Gaussian noisy vectors.
- ✧ Explained the similarity of two drug structures with a cosine similarity function on latent vectors, generalized our model on regression tests successfully and visualized the clustering results with t-SNE.
- ✧ Led a four-member team. Co-first authored paper has been published in AI4PH workshop, ICLR 2021

Supervised Machine Learning in Predicting Human Comfort *Jul. 2019 – Aug. 2019*

Research Assistant, UC Berkeley | Advisor: Prof. Maohui Luo, Berkeley CBE

- ✧ Initiated **benchmarking** supervised machine learning methods to classify human comfort in building & environment domain.
- ✧ Performed random/selected hyper-parameter searches and explored hyper-parameters' effect on classification results.
- ✧ Explored pipelines in collecting data and using machine learning methods to preform individual user comfort prediction.
- ✧ Two related papers have been published in top tier journal: Energy and Buildings (IF = 5.879)

PROJECTS

Natural Language Processing Camp *Jun. 2021 – present*

Independent Researcher| Advisor: Prof. Zhiyuan Liu, Tsinghua University

- ✧ Command of word2vec and Bert(with attention mechanism), pre-trained models such as Roberta, neural machine translation models such as seq2seq and Transformer, as well as the construction and head-tail extraction of knowledge graph.
- ✧ Independently designing an open task of rumor detection based on graph adversial networks.(In progress)

TransportED: A Warehouse Robot for Collecting Parcels *Jan. 2021 – Apr. 2021*

Team Member, Hardware Engineer|Advisor: Barbara Webb

- ✧ Helped build a warehouse robot called **TransportED** which served to perform parcels' transportation process, as well as collect the parcels from a higher shelf with lifting robot platforms and avoid collisions with other warehouse robots.
- ✧ Contributed to our robot's navigation and path-finding part in **Webots**, wrote main parts of four demo reports and helped design hardware section of the poster and user guide for presentation. (Github)

Autonomous Drone Route Design with Rectified A* algorithm *Sept. 2020 – Dec. 2020*

Independent Researcher| Advisor: Stephen Gilmore

- ✧ Rectified normal **A*** path-finding algorithm on graphs to suit for planning autonomous drone's route in 150 steps with obstacles and 36 possible directions for each step; took advantage of geojson and what3words app to visualize the minimum steps in a potential route.
- ✧ Provided an efficient framework for PhD students to record AQI index around Edinburgh with autonomous drones.
- ✧ Coded the program within 800 lines which is based on Java; wrote a 15-page project paper which earned A in final. (Github)

ACADEMIC ACTIVITIES

ECML/PKDD 2021Attendee, Workshop Presenter *To appear*
ICLR 2021 Attendee, Workshop Presenter *May 2021*
2020 Duke University Winter Seminar on Entrepreneurship *Jan. 2019 – Feb. 2019*

WORKING AND TEACHING EXPERIENCES

Google Deep Learning Intern, remote *Aug. 2021 - present*

- ✧ To help on industrialized Natural Language Processing Projects.(In progress)

Intern at Edinburgh University Formula Student *Jan. 2021 – Apr. 2021*

- ✧ Served as an electronic engineer in the AI electonics team and was responsible for the design of APPS component of a race car.

Intern at Westlake University, China *Winter 2020*

- ✧ Filtered and cleaned the twitter texts' question and answer data.

Teaching Assistant at Huazhong University of Science and Technology *Sept. 2017 – Jan. 2019*

- ✧ Gathered students' assignments of engineering courses and done corrections.
- ✧ At the same time served as one of learning department committee members in college student union for gathering students' concerns and arranged self-studying as well as mid-term simulation tests.

PRIZES

Annual Edinburgh-HUST Scholarship 2019, 2020, 2021
HUST Freshman Arts Scholarship 2018
Freshman Football Cup Championship, Goal Keeper 2017

SKILLS

Deep Learning on Graphs: PyTorch Geometric(PyG), Deep Graph Library (DGL)(skilled)
Machine Leaning: Pytorch, Tensorflow, Keras, Sklearn, R, Pyro (Probabilistic Graphical Models)(skilled)
Objective Programming: C++, C, JAVA (intermediate)
Others: JSON, HTML
Hobbies: Baseketball, Go.

FOREIGN LANGUAGES

GRE: 323 (Verbal: 153 + Quantitive: 170), Writing: Unknown
TOEFL: Null (2021/09/04 first time)