Yurou Dai

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Education

University of Electronic Science and Technology of China **Chengdu, China**

Master of Software Engineering, School of Information and Software Engineering *Sept. 2019 - Jun. 2022*

- **GPA: 3.63/4.00 (Comprehensive Ranking 4/184)**
- **Honors & Awards:** National Scholarship (Top 2%), Goodix Technology Scholarship(Top 5%), Provincial Outstanding Graduate (Top 2%), First-Prize Academic Scholarship, Excellent Graduate Teaching Assistant and Excellent Graduate Student Cadre.
- **Relevant Coursework:** Graph Theory and Its Application, Neural Network and Deep Learning, Algorithm Design and Analysis.

Chongqing Normal University **Chongqing, China**

Bachelor of Software Engineering, School of Computer and Information Science *Sept. 2015 - Jun. 2019*

- **GPA: 3.91/4.00 (Ranking 1/44)**
- **Honors & Awards:** National Encouragement Scholarship × 2 (Top 1%), First-Prize scholarship × 3 (Top 1%), Merit Student, Excellent Volunteer.
- **Relevant Coursework:** Data Structures, Discrete Mathematics, Computer Networks, Linear Algebra, Probability and Statistics.

Working Experience

City University of Hong Kong, Department of Computer Science **Hong Kong, China**

Research Assistant *Aug. 2022 - Present*

"Autonomous Driving System based on Autoware Universe" - Engineering Projects Cooperated with Foxconn Technology Group

- Completed the mapping and matching part in the localization module. The point cloud maps and car's position were built using the NDT/SLAM algorithm, which was utilized on the Robot Operating System (ROS) and utilized pure Lidar data as input.
- Used Vector Map Builder tool to label PCD maps which built to generate a semantic maps (Lanelet2).
- Realized a surrounding-view-system in order to better display the surrounding environment of the vehicle in real time, which used four Fisheye cameras and mainly utilized PyQt and OpenCV libraries.
- Upgraded the perception module by switching from a statistical learning algorithm to a deep learning model.

University of Electronic Science and Technology of China **Chengdu, China**

Master student *Feb. 2021 – Jun. 2021*

Engineering Projects Cooperated with The 10th Research Institute of China Electronics Technology Group Corporation

- Obtained aircraft trajectories from ADS-B, preprocessed the trajectory data, organized and wrote the project documents.
- Completed experiment and wrote a thesis – 4D trajectory prediction model based on the attentional recurrent network which is published in Telecommunication Engineering.

University of Electronic Science and Technology of China **Chengdu, China**

Teaching Assistant – "C programming language & Theory and Technology of Network Security" *Mar. 2020 – Jan. 2021*

- Assisted Prof. Ting Zhong and Prof. Wei Chen to completing teaching tasks, such as: collecting and correcting homework, counting student attendance, answering some questions from students, correcting the end-of-term paper, etc.

Publication

Journal:

[1] **Dai, Y.**, Yang, Q., Zhang, F., & Zhou, F. (2021). Trajectory Prediction Model of Social Network Users Based on Self-supervised Learning. Journal of Computer Applications, 41(9), 2545. [pdf]

[2] Zhou, F., **Dai, Y.**, Gao, Q., Wang, P., & Zhong, T. (2021). Self-supervised Human Mobility Learning for Next Location Prediction and Trajectory Classification. Knowledge-Based Systems, 228, 107214. [pdf] *(Student-first author)*

[3] Liu, L., **Dai, Y**, Cao Y., & Zhou F. (2023) A Survey of User Geographic Location Prediction Based on Online Social Network. Journal of Computer Research and Development. [pdf] *(Student-first author)*

[4] Cao, C., Zhou, F., **Dai, Y**., & Wang, J. (2022). A Survey of Mix-based Data Augmentation: Taxonomy, Methods, Applications, and Explainability. Under review in ACM Computing Survey. arXiv preprint arXiv:2212.10888. [pdf]

Patent:

[1] Construction and Prediction Method of Long-Tail Cascade Prevalence Prediction Model Based on Decoupling Backbone Network and Regressor. (Patent No. 202111169186.X)

Computer Software Copyright:

[1] A Intellectual Clearance Game Implemented in C - "Please enter the pit". (Registration No. 2018SR585810)

Research Experience

University of Electronic Science and Technology of China **Chengdu, China**

Dissertation Research *Jun. 2020 – Jun. 2022*

Dissertation: "Human Trajectory Analysis Based on Self-supervised Learning" *Advisor: Fan Zhou*

- Carried out experiments and wrote a paper on the Trajectory Prediction model based on Social Network, which took a session-based method to augmented data and used Contrastive Learning to learn the implicit trajectory representations in the latent space. [Paper Link] This work was supported by National Natural Science Foundation of China (Grant No. 62072077) .
- Designed a Self-supervised Mobility Learning (SML) framework to encode human mobility semantics, which performed spatio-temporal data augmentation and used InfoNCE as the contrastive loss, and conduct it on two applications (Location Prediction and Trajectory Classification), the experiments in different datasets (such as Gowalla and Foursquare) obtained excellent results. [Paper Link] This work was supported by National Natural Science Foundation of China (Grant No. 62072077 and No. 61602097).
- Proposed a framework based on Decoupled Contrastive Mobility Learning (DCML), which solved the Negative-Positive Coupling effects (NPC) in the trajectory samples and removed the NPC multiplier to alleviates the requirement for computing. [Dissertation Link]

University of Electronic Science and Technology of China **Chengdu, China**

Survey Research *Feb. 2021 – Oct. 2021*

- Wrote a survey about User Geographic Location Prediction based on Twitter and Geo-Social Networking data.
- Completed all stages of the research process of a survey, including reading and synthesizing literature, analyzing the data types and methods used, classified data source, and summarizing the methods in recent years. [Paper Link] This work was supported by National Natural Science Foundation of China (Grant No. 62072077 and No. 62176043) and Science and Technology Plan Project of Sichuan Province (Grant No. 2022YFSY0006)

Chongqing Normal University **Chongqing, China**

Undergraduate Research Program *Sept. 2018 – Apr. 2019*

Project: "Candidate Detection System Based on Face Recognition" (Group leader 1/3)

- Designed a C/S architecture project, responsible for the realization of the user interface part in the client, used OpenCV library to preprocess face images, and leveraged CNN to realize facial feature extraction and recognition.
- Implemented of this project is based on Protocol Buffer, ZeroMQ, C++, Qt, QML, and SQL.

Skills

Programming	Python, C/C++, Java, SQL (MySQL), JavaScript, HTML/CSS, QML.
Framework	Tensorflow, Pytorch, Keras, Ros.
Language	Chinese (native), English (fluent).
Hobbies	Photography, Running, Biking, Badminton.