Jiajie(Chance) Li

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Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA
Visiting Student; the City Science group in the Program in Media Arts and Sciences — *Jan. 2022 – July. 2022(Expected)*

- **Supervisor**: Prof. Kent Larson

Tongji University — Shanghai, China
B.Eng. in Software Engineering, Concentration in Media Art and Science; GPA: 93.3/100 — *Sept. 2018 – July. 2022*

- **Advisor**: Prof. Shengjie Zhao, Prof. Hongming Zhu
- **Honors and Awards**: NITORI International Scholarship(**Top 1/437**); 2*National Scholarship(**Top 1%**)
- **Leadership**: President of the Red Cross; President of the Tongji Apple Club; Vice President of Lenovo Idea Elite Association; Member of the National Innovation Project; Member of Tongji University's Entrepreneurial Valley Project

Tongji University — Shanghai, China
Transfer Program - Freshman Year, Major in Civil Engineering; GPA: 83.7/100 — *Sept. 2017 – July. 2018*

Research Experience

City Science Lab@Shanghai(Tongji-MIT City Science Lab) — Shanghai, China
Undergraduate Researcher — *Apr 2019 - Present*

- **Equity and Decentralisation**: *Equity WITHOUT Zoning* - Proposed to host the workshop in the form of a serious game; participated in the prototyping and workshop logic discussions; transformed GAMA Platform into a web page and deployed it; Co-hosted the workshop on City Science Summit 2020; *Sustainable Cities WITH Decentralization* - Participated in workshop design; Co-hosted the workshop on City Science Summit 2021.
- **Fine-grained Urban Sensing and Analysis(Livingline Project)**: *Camera Data Analysis* - Implemented 3D mapping of multiple cameras for joint analysis; Used deep learning for automatic data anonymisation; Designed a three-steam neural network to identify pedestrian interactions; *WiFi Data Analysis* - Analyzed pedestrian behavior patterns; Performed clustering on Wi-Fi predicted trajectories based on geometric and semantic features; Participated in thesis writing; *Social Media Data Analysis* - Designed and developed a crawler framework to retrieve various information sources (such as WeChat Official Accounts) that cannot be retrieved by traditional methods.

The Alan Turing Institute & University of Warwick — Coventry, United Kingdom
Research Assistant, Advisor: Prof. Hongkai Wen — *Mar 2021 - Present*

- **Large-scale Urban Computing and Knowledge Transfer**: Investigated traffic flow prediction based on LBS data; Investigated traffic signals control using multi-agent reinforcement learning; Investigated solutions of dilemma between Covid-19 lockdown and mobility by dynamic assignment of traffic quotas to each road; Proposed novel methods for inter-city knowledge transfer with neural networks, enabling underdeveloped cities to make decisions based on scarce data.
- **Large-scale Urban Data Processing**: Collected and processed a large amount of taxi GPS data, OSM POI data, road network data; Performed traffic data binding and analysis using OSRM; Crawled and post-processed publicly available traffic data using scrapy.

Future Lab, Tsinghua University — Beijing, China
Research Assistant, Advisor: Prof. Danqing Shi — *Mar 2021 - Sept 2021*

- **Data Sonification**: Used computer vision and digital image processing methods to process SONAR data and performed data sonification using MAX/MSP and Sonic Pi.
- **Sensors(SONAR and Infrared)**: Used GAN to reconstruct water surface normals and depth information from monocular water surface images. Used SONAR to perceive fishes and the topography of the seafloor to produce installation art.

School of Software Engineering, Tongji University — Shanghai, China
Research Assistant, Advisor: Prof. Yang Shi — *Sept 2020 - Mar 2021*

- **Private Sensing and Gait Recognition**: Investigated the non-pixel-based Neuromorphic Vision Sensors (NVS); Proposed new encryption algorithms for event camera; Used graph convolutional neural networks to identify human biological information(gait) to accomplish traditional tasks while protecting privacy and data ethics.

Center of Digital Innovation (CDI) — Shanghai, China
Research Assistant, Advisor: Prof. Xiaohua Sun — *July 2020 - Spet 2020*

- **Digital Twin for Enhancing Psychoanalysis and Therapy**: Built a multimodal interactive system; Used deep learning and scene graph for more effective sandtray interpretation and psychological analysis; Built a tangible interactive system to enhance visitor storytelling and physiotherapy.

College of Design and Innovation, Tongji University Shanghai, China
Research Assistant, Advisor: Dr. Weiwei Guo *July 2019 - May 2020*

- **Drones and Surveillance Cameras for Crowd Counting**: Proposed a novel architecture termed as "Relational Extractor"(RE) which models the multiplicative interaction features of adjacent frames, which extracted the information of the number of pedestrians in the spatio-temporal dimension more efficiently.

College of Civil Engineering, Tongji University Shanghai, China
Research Assistant, Advisor: Prof. Miaomiao Zhang, Prof. Dalei Wang *Jan 2019 - Apr 2020*

- **Computer Vision-based Intelligent Disaster Prevention**: Designed a building apparent disease detection device based on computer vision; Captured and stored avatars with multiple cameras; Used image stitching technology to obtain a panorama, and then used semantic segmentation(Deeplab V3 + Res-UNET) for cracks detection. This project is a national-level innovation project and joined the 15th Venture Valley of Tongji University.

Practical Experience

Butlr Shanghai, China
Technical Consultant *May 2021 - Nov 2021*

- **Algorithm Research**: Built a series of learning-based models for thermal sensor recognition algorithms, and performed model quantification to make it suitable for edge computing scenarios.
- **Data Synthesis**: Used Unity Perception for highly customizable and efficient data synthesis and uses various domain adaptation methods to make synthetic data closer to real data; Built an automated labeling pipeline using LiDAR data and thermal sensing data; Investigated the principles of thermal sensor imaging and synthesised a large amount of training data using an improved data augmentation method.

Microsoft Research Asia (MSRA) Beijing, China
Fulltime Research SDE Intern *Nov 2020 - May 2021*

- **Human-Computer Interaction**: Optimized the interaction flow of data tools as UI/UX designer in the Innovation Engineering Group and and implemented them.
- **Data Analysis**: Worked as a full-stack engineer in Face SDK Team Data Sub Team to develop data related tools, involving data crawling, storage, processing, and analysis; Optimised pipeline for data processing and storage, researched and improved existing face recognition algorithms.

Pixelshift.AI Shanghai, China
Computer Vision Engineer Intern *Nov 2019 - May 2020*

- **Algorithm Research**: Conducted research on generative models and generative design; Used styleGAN for research and optimization of handwritten font generation; Developed data visualization UI using ipywidget.

Publications and Working Papers

- **Cross-City Transfer Learning for Anti-epidemic Policies and Traffic Flow Prediction**: *2021, The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (UbiComp/IMWUT), Under Review, First Author*
- **Event Encryption for Neuromorphic Vision Sensors: Framework, Algorithm, and Evaluation**: *2021, IEEE Sensors, Co-author*
- **PHNet: Parasite-Host Network for Video Crowd Counting**: *2020, International Conference on Pattern Recognition(ICPR), Joint First Author & Corresponding Author*
- **Supporting Therapeutic Storytelling and Therapist's Neutrality in Sandtray Therapy Through a Digital Twin**: *First Author, Working Paper*
- **Identifying human interactions in built environment: deep learning analytics on camera data for urban vibrancy evaluation**: *Environment and Planning B, Under Review, Co-author*
- **Street dynamics: Understanding finer-grained spatio temporal street activities using Wi-Fi sensors**: *Environment and Planning B, Under Review, Co-author*

Selected Awards

- **KDD CUP 2021-City Brain Challenge**: Ranked **Top 5%** of all teams worldwide as team leaders.
- **CCF Outstanding University Student Award**: Jointly recommended by the China Computer Federation(CCF) permanent directors(three best students in the country each year).
- **Ranked 1st in China-U.S. Young Maker Competition Final(Shanghai)**: As a core member and lead developer, I led the team to 1st place in the final competition, which had 37 teams and over 200 participants.
- **CCF Certified Software Professional(350/500)**: Ranked **Top 0.57%** of all the historical contestants.

Technical Skills and Languages

- Skills: **Data Analysis and Visualization** (Julia, Python, C++, MATLAB, SQL, D3), **Spatial Analytics** (ArcGIS, QGIS, Oracle Spatial Studio), **Web Development** (React, Vue, HTML, CSS, JavaScript, D3, ASP.NET), **Design and Modeling** (Maya, Unity3D, AutoCAD, Figma, Adobe XD, Adobe PS, Axure), **Data Extraction** (Scrapy, Selenium, Axios, Fiddler, Flaui), **Tools** (PyTorch, TensorFlow, scikit-learn, MySQL, Redis, MongoDB, AWS, Azure, Linux, Docker, Git)
- Languages: English (Fluent), Chinese (Native)