

Education

Stanford University

CHEMICAL ENGINEERING

2018.06

Master of Science

Rutgers University

CHEMICAL ENGINEERING, SUMMA CUM LAUDE, TAU BETA PI

2016.06

Bachelor of Science

Working Experience

KE Holdings Inc.

RESPONSIBLE FOR DESIGNING DEEP LEARNING BASED APPLICATIONS.

Beijing, China

2020.09 Until Now

- **Floor Plan Recognition and Reconstruction Algorithm:** Responsible for identifying and vectorizing various types of floor plans using methods based on object detection, image segmentation, and line segment detection.
- **AI Design for FUTURE HOUSE Platform:** Responsible for developing and optimizing AI house interior design algorithms. The projects I am responsible for include but are not limited to: large space partitioning algorithm, floor plan transformation strategies, and furniture location programming algorithms for living rooms, dining rooms, study rooms, and many others.
- **Optical Character Recognition Service (KeOCR):** Responsible for developing certification recognition algorithms, including house certificates, ID cards, and financial materials. Responsible for optimizing the table recognition algorithm (used for image content recognition of various reports and tables) with line segment detection algorithms. Responsible for developing image preprocessing algorithms, including image quality detection algorithms based on edge detection and deep learning, and the seal/stamp elimination algorithm based on Pix2Pix.
- **Image and Video Watermarking:** Responsible for building invisible watermarking algorithms based on Fourier Transformation. Reproduce the Pix2Pix algorithm and develop watermark removal algorithms for internal attack and defense drills. Responsible for developing watermark detection algorithms based on YOLO object detection method.
- **Quick Image Comparison Algorithm:** Responsible for developing image comparison algorithms for the house checking services. Developed a set of image vectorization methods based on: 1) traditional image processing methods such as SIFT, and 2) unsupervised deep learning algorithms.
- **Speech Recognition and Language Analysis Algorithms:** Design deep learning based speech recognition algorithms which translate phone recordings to texts. Design a fuzzy pinyin search method to identify the keywords. Responsible for downstream processing algorithms.

Wujie Technology (Shenzhen) CO.,LTD

ESTABLISHED BY THE FORMER CEO OF SF TECHNOLOGY. RESPONSIBLE FOR DESIGNING DEEP LEARNING BASED APPLICATIONS.

Shenzhen, China

2019.04 - 2020.09

- **Heuristic Search and Reinforcement Learning on Combination Optimization:** Responsible for solving various types of combinatorial optimization problems (including but not limited to TSP, PCTSP, CVRP, and CVRPTW). Responsible for exploring approaches of heuristic search/reinforcement learning to solve various types of delivery problems.
- **3D Reconstruction of Express Parcels:** Use binocular cameras to reconstruct 3D models of the express package, and obtain the volume information to realize fast price calculation. Responsible for camera calibration, binocular image correction, and implementing and improving stereo matching algorithms to obtain depth maps.
- **Detection And Recognition in Express Delivery Transits:** Use deep learning methods to perform image segmentation and identify the cargo storage area. Use deep learning based detection model to detect the location of the vehicles. Use segmentation models with contour detection and contour simplification to find out the location of car plates. Use recognition models based on CTC to recognize car plates' numbers and characters.
- **The Entity Classification Tool for Express Delivery:** Responsible for designing the classification algorithm for express delivery consignments using Naive Bayes. The product names and the hierarchical classes for training and testing are crawled from taobao.com and JD.com

- **Speech Recognition Recognition on Phone Recordings:** Responsible for designing and developing the data labeling tool with PyQT. Responsible for the reproduction of the DeepSpeech2 algorithm and built a pinyin/syllables to texts translation model. Our open-source speech recognition codes won more than 100 stars on Github: <https://github.com/chenmingxiang110/Chinese-automatic-speech-recognition>
- **Voiceprint (Speaker) Recognition on Phone Recordings:** Responsible for designing and developing the data labeling tool with PyQT. Responsible for reproducing GE2E as the method for speaker recognition. The service is used to automatically identify suspecting calls of insurance fraud.

Research

AugNet: End-to-End Unsupervised Visual Representation Learning with Image Augmentation

arXiv: 2106.06250.

CHEN, M., CHANG, Z., LU, H., YANG, B., LI, Z., GUO, L., & WANG, Z.

- <https://github.com/chenmingxiang110/AugNet>

Image Generation With Neural Cellular Automatas

arXiv: 2010.04949

CHEN, M. & WANG, Z.

NIPS 2021 workshop

- <https://github.com/chenmingxiang110/VAE-NCA>

Predicting Geographic Information with Neural Cellular Automata

arXiv: 2009.09347

CHEN, M., CHEN, Q., GAO, L., CHEN, Y., & WANG, Z.

AAAI 2021 workshop (spotlight)

- <https://github.com/chenmingxiang110/Growing-Neural-Cellular-Automata>
- https://github.com/chenmingxiang110/NCA_Prediction

Dynamic Partial Removal: A Neural Network Heuristic for Large Neighborhood Search

arXiv: 2005.09330

CHEN, M., GAO, L., CHEN, Q., & LIU, Z.

- <https://github.com/water-mirror/DPR>

Learn to Design the Heuristics for Vehicle Routing Problem

arXiv: 2002.08539

GAO, L., CHEN, M., CHEN, Q., LUO, G., ZHU, N., & LIU, Z.

IJCAI 2020 workshop

- <https://github.com/water-mirror/NeuLNS>