Chengyuan Deng

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Education

Rutgers University, New Jersey, USA — Sep 2018 - present
Master of Science in Computer Science

- *Advisor:* Prof. Dipankar Raychaudhuri
- *GPA:* 3.58

Tongji University, Shanghai, China — Sep 2014 - Sep 2018
Bachelor of Engineering in Electronics and Information Engineering
Minor in Applied Mathematics

- *Overall GPA:* 3.62

Research Interest

Primary research interest: Machine Learning Methodology, Representation Learning in NLP, graph, symbolic knowledge, etc.
Tentative: Intersection of TCS and Machine Learning, Graph Streaming Algorithms

Conference Publications

Chen Wang and **Chengyuan Deng**, "On the Global Self-attention Mechanism for Graph Convolutional Networks", *International Conference in Pattern Recognition, ICPR 2020*

Chen Wang, **Chengyuan Deng** and Vladimir Ivanov, "SAG-VAE: End-to-end Joint Inference of Data Representations and Feature Relations", *International Joint Conference in Nerual Network, IJCNN 2020**(Oral)***

Journal Publications

Chen Wang, **Chengyuan Deng** and Ruisen Luo, Adaptive Ensemble of Classifiers with Regularization for Imbalanced Data Classification, *Information Fusion*

Chen Wang, **Chengyuan Deng** and Suzhen Wang, "Imbalance-XGBoost: Leveraging Weighted and Focal Loss for Imbalanced Binary Classification with XGBoost", *Pattern Recognition Letter*

Research Experiences

Research Assistant at Rutgers WinLab, Rutgers University
Advised by Prof.Dipankar Raychaudhuri, Dr.Wuyang Zhang

- Immersive VR Gaming Optimization over 5G network with Nvidia CloudXR Platform.

Self-motivated Research Student, Rutgers University
Four papers published — Aug 2019 - present

- Engaged in the research on label-imbalanced classification, proposed AER algorithm and developed imbalance-XGBoost python library.
- Proposed Self-attention Graph Variational Autoencoders, which can simultaneously learn feature relations and data representations in anend-to-end manner.
- Proposed Global Self-attention Graph Convolutional Networks, which outperformed on benchmark graph kernel datasets in node classification and graph classification tasks. We also provided a theoretical proof that GSA-GCN is able to alleviate over-smoothing.

Research Intern, Recurrent.ai
Advised by Dr. Zhilin Yang Sep 2019 - Nov 2019

- Pre-processed and trained a new-collected Chinese text-to-speech dataset with Tacotron and Tacotron2
- Introduced a novel approach of leveraging Pinyin in the training process
- Outperformed former results and achieved long-text generation, reduced EOS into 2 seconds.

Undergraduate Research Assistant, Tongji University
Advised by Prof. Asoke Nandi Dec 2017 - Mar 2018

- Implemented Bi-CoPam algorithm, which synthesized three clustering algorithms, namely K-Means, hierarchical clustering and SOM into consensus partition matrices to optimize results, corresponding to specific brain zones.
- Located commonly responded brain zones precisely by training FMRI images of people listening to music pieces, which can be classified into liked and happy, liked and sad, disliked and happy, disliked and sad.

Selected Projects

Distribution Testing in Multi-pass Streaming Model
Advised by Prof. Sepehr Assadi, course project for CS514: Sublinear Algorithms

- Literature Review of Distribution Testing in Single-pass Streaming Model and Distributed Communication Model.
- Proved a lower bound in Multi-pass Streaming Model for Uniformity Testing

Imbalance-XGBoost
Self-motivated

- **Open-source python library**, availabe on Github and PyPi, star 140+.
- The library leverages weighted and focal loss for imbalanced binary classification with XGBoost. State-of-the-art performances were achieved on a recently collected Parkinson disease dataset by Focal-XGBoost. Paper published.

(Kaggle) Intersection Congestions Prediction
Advised by Prof. Saed Sayad

- Implemented multiple regression models, neural networks, CatBoost, LightGBM, XGBoost to predict waiting time and distance at intersections in four cities: Atlanta, Boston, Chicago and Philadelphia.
- XGBoost outperformed other approaches, **leaderboard 25/432**.

Micro-Me
Collaboration with designers at University of College in London

- Implemented Faster-RCNN, YOLO3 and Facebook Object Detection API with Tensorflow on image datasets of foods and fruits, the models are able to detect 110 kinds of foods and fruits with accuracy of 90+%.
- Built a web app for demo using Bootstrap and Flask. The app is able to detect foods in the uploaded image and return fibre content.

Hybrid Neural Network Based Movie Recommendation System
Advised by Prof. Yongfeng Zhang, course project for CS550: Data Mining

- Proposed a novel recommendation system with sliding-window convolution and various neural networks training on different movie features, also integrated matrix factorization methods for comparison.
- The system included following functions: predicting ratings, top n recommendation list, top n similar movies, top n other favorite movies.

- **ESSAY**

Industrial Experiences

Machine Learning Intern, Newark — Jan 2020 - Mar 2020
Haystack.ai

- Engaged in developing deep learning models from cutting-edge academic papers for real-world applications
- Example Project: Selfie-to-anime. Collected anime images for training, implemented a cutting-edge paper published in ICLR 2020 "Unsupervised Generative Attentional Networks" and built the API with Flask.

Software Engineering Intern, Shanghai — Jun 2017 - Sep 2017
Tongji Fintech and Big Data Institute

- Designed and developed the **first** software product of accurate alleviation upon Guizhou Province based on blockchain API

Data Analysis Intern, Shanghai — Jun 2016 - Sep 2016
Haitong Securities, International

- Analyzed the daily stock quotation and cyclical data by setting up models then predicted trends
- Proposed financial models for cutting-edge companies and wrote reports, with **200**+ pageviews daily

Honors and Awards

◇ Yamaha Asian Music Scholarship of Honorable Mention, **Piano Performance**, *2017 Shanghai.*

◇ ACM Programming Contest, Shanghai Regional, **First Prize**, *2018 Shanghai.*

◇ Mathematical Modeling Invitation of U.S.A. **Second Prize**, *2018 Shanghai.*

◇ National Undergraduate Contest in Mathematical Modeling, **First Prize**, *2017 Shanghai.*

◇ National Undergraduate Contest in Electrical Design, **Third Prize**, *2017 Shanghai.*

Leadership

◇ **President,** Student Pianist Association of Tongji University, *2017-2018.*
Held two anniversary concerts in classical music, presented performances in multiple campus concerts.

◇ **Program Manager,** Junior Achievement, *2016-2017.*

◇ **Volunteer,** mathematics teacher in elementary school, *2015.*

Teaching Assistant

◇ Introduction to Programming(CS111), Rutgers University