TZU-HSIN YANG

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Research Interests

Bayesian Inference, Deep Probabilistic Models, Uncertainty Estimation, Network Science, Reinforcement Learning

Education

National Cheng Kung University, *Tainan, Taiwan* *Jul. 2018*

· Master of Science in Computer and Communication Engineering
- Overall GPA: 4.0/4.0

National Chiao Tung University, *Hsinchu, Taiwan* *Jun. 2016*

· Bachelor of Science in Electrical and Computer Engineering
- Last 60 GPA: 3.27/4.0

Work Experience

Research Assistant, *Academia Sinica, Taipei, Taiwan* *Oct. 2020 – Present*

· Developing Insurance Fraud Detection System based on ***GNN*** model
· Developing graph visualization system

Data Scientist, *KKBOX Inc., Taipei, Taiwan* *Jun. 2019 – Aug. 2020*

· User Behavior Analysis
- Developed ***XGBoost*** and ***LightGBM*** to predict churn users
- Discovered key factors of churn behavior with ***SHAP***
- Developed ***ARIMA*** models to predict number of transactions
- Modeled user journeys on app as a feature of users via semantic embedding with ***fastText***
- Built ***Redash*** dashboards to develop insights and make data-driven decisions with ***PrestoSQL***

· Music Personalized Recommendations
- Developed Spark ML Pipelines for playlists recommendation
- Diversified playlists to increase user retention by excluding the streams caused by recommendations
- Designed metrics of AB testing including average stream, retention and stream growth

· Public Opinion System
- Developed a crawler pipeline for regular update of articles using GitLab and Jenkins
- Implemented a NER system with Chinese NLP tools (***CkipTagger***)

Deep Learning Scientist and Bioinformatician, *Insilico Medicine Inc., Taipei, Taiwan* *Aug. 2018 – May. 2019*

· Molecules Generation: implemented conditional generative models for generation given properties
· MRI Brain Image Analysis: implemented ***Unet*** model to segment images

iOS Mobile App Developer, *National Cheng Kung University Library, Tainan, Taiwan* *Aug. 2017 – Jun. 2018*

· Developed a mobile library app including circulation services for twenty thousand students and faculty

Teaching Assistant, *Department of Electrical Engineering, NCKU, Tainan, Taiwan* *Sep. 2016 – Jun. 2017*

· Teaching assistant for CS101 (Introduction to Computers) (C++)
· Won Teaching Assistant Awards for both fall and spring semesters

Publications

(First author) DNA: General Deterministic Network Adaptive Framework for Multi-Round Multi-Party Influence Maximization, *accepted paper in IEEE International Conference on Data Science and Advanced Analytics (acceptance rate: 20%)* *Oct. 2018*

- Developed a ***MCTS***-based framework which adapts to network change in the long run
- Developed influence maximization algorithms from game theory perspectives
- Designed a network similarity estimation method for new data prediction

(Third author) LSTMEnsembler: A LSTM-based Ensemble Framework for Predicting the Success of Mediation Requests Using Case Properties and Textual Information, *submitted to ACM Digital Government: Research and Practice Oct. 2020*

- Conducted the first research on predicting the success of real-world mediation cases
- Developed a ***LSTM***-based framework based on the case information and textual descriptions
- Implemented a system for public servants and the public to decide whether to enter mediation process

Projects

(Kaggle) COVID19 Global Forecasting , *held by The White House OSTP* *Mar. 2020*

- Forecasted confirmed cases and fatalities between March 25 and April 22 by region
  - Developed a vector autoregressive moving average model (***VARIMA***) to predict regional values
  - Ranked in top 13% in the competition

(Kaggle) MolHack: Apply deep learning to speedup drug validation , *held by Insilico Medicine Inc.* *May. 2018*

- Predicted the stability of the complex given ligand-pharmacophore pairs
  - Developed a regressor based on deep neural network on well-preprocessed data
  - Won 2^{nd} place in the competition

(Course Project) Energy Consumption Analysis and Prediction for Household Planning, *NCKU* *Jan. 2017*

- Designed an algorithm to predict a household electricity consumption
  - Selected important features with random forest and predicted with linear regression models

(Course Project) Mining Geo-Social Services for Optimal Location Placement, *NCKU* *Nov. 2016*

- Designed an algorithm to rank top locations for hotels and theaters placement
  - Used hill climbing optimization algorithm with ***NDCG*** ranking score

(Course Project) Social Relationship inference from Urban Footprint , *NCKU* *Oct. 2016*

- Designed an algorithm to predict whether people are friends on social media with users' check-in data
  - Selected important features and used cosine similarity to measure the similarity between pairs

Skills

Programming Languages

- Python, C++, R, Scala, SQL, HTML, CSS, JavaScript, Matlab, Swift, MongoDB

Certificate

- **TOEFL iBT Scores:** 107 (R29, L27, S23, W28)
- **Microsoft Certified:** Azure Fundamentals

Relevant Coursework

- **University courses:** Linear Algebra, Differential Equation, Probability, Intelligent Data Analysis, Internet of Things and Urban Computing, Data Mining and Social Network Analysis
- **Online courses:** ML, DS and DL with Python (Udemy), Bayesian Inference (Coursera)

References

Research Advisor **Jen-Wei Huang, Ph.D.**
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