TZU-HSIN YANG

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RESEARCH INTERESTS

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

EDUCATION

National Cheng Kung University (NCKU), Tainan, Taiwan Jul. 2018
- Master of Science in Computer and Communication Engineering
  - Overall GPA: 4.0/4.0

National Chiao Tung University (NCTU), 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 an Insurance Fraud Detection System based on **GNN** models
- Developing a graph visualization system with **Node.js** and **D3.js**

Data Scientist, KKBOX, Taipei, Taiwan Jun. 2019 – Aug. 2020
- User Behavior Analysis
  - Developed **XGBoost** and **LightGBM** to predict churn users
  - Discovered key factors of churn behaviors with **SHAP**
  - Developed **ARIMA** models to predict the number of transactions
  - Modeled user journeys on the application via semantic embedding with **fastText**
  - Visualized data with **Redash** dashboards and **PrestoSQL**
- Music Personalized Recommendations
  - Developed Spark ML Pipelines for playlists recommendation
  - Diversified playlists by excluding bias of data to increase user retention
  - Conducted **Firebase** A/B testing
- Public Opinion System
  - Developed a regular crawler pipeline using GitLab and Jenkins
  - Implemented a NER system with Chinese NLP tools (**CkipTagger**)

Deep Learning Scientist and Bioinformatician, Insilico Medicine, Taipei, Taiwan Aug. 2018 – May 2019
- Molecule Generation: developed conditional generative models
- MRI Brain Image Analysis: implemented the **Unet** model to segment images

iOS Mobile App Developer, NCKU Library, Tainan, Taiwan Aug. 2017 – Jun. 2018
- Developed a mobile library application for students and the faculty

Teaching Assistant, Department of Electrical Engineering, NCKU, Tainan, Taiwan Sept. 2016 – Jun. 2017
- Teaching assistant for Introduction to Computers (C++)
- Won Teaching Assistant Awards for both fall and spring semesters

PUBLICATIONS

T. Yang, H. Ma and J. Huang, "DNA: General Deterministic Network Adaptive Framework for Multi-Round Multi-Party Influence Maximization", 2018 IEEE 5th International Conference on Data Science and Advanced Analytics (DSAA)
- Developed an **MCTS**-based framework that adapts to network changes in the long run
- Developed influence maximization algorithms from game theory perspectives
- Designed a network similarity estimation method for new data prediction

H. Hsieh, J. Jiang, T. Yang and R. Hu, "LSTMEnsembler: A LSTM-based Ensemble Framework for Predicting the Success of Mediation Requests Using Case Properties and Textual Information", submitted to 2020 ACM Digital Government: Research and Practice

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

COMPETITIONS

COVID19 Global Forecasting, held by The White House OSTP Mar. 2020

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

MolHack: Apply deep learning to speedup drug validation, held by Insilico Medicine May 2018

- Predicted the stability of the complex given ligand-pharmacophore pairs
  - Won 2nd place in the competition out of 13 teams
  - Developed a feedforward neural network based on normalization

KKBOX Data Game: TV Show Recommendation, held by KKBOX Jun. 2017

- Designed an algorithm to predict the next TV show
  - Performed exploratory data analysis and developed linear regression models

Mei-Chu Hackathon, held by NCTU and National Tsing Hua University Dec. 2014

- Developed an Automated Jumpshot Photo System
  - Won 1st place in the competition out of 30 teams
  - Developed an Arduino module with accelerometer sensors
  - Developed an iOS camera application connecting to the Arduino module

PROJECTS

Statistics with R Specialization, Duke University (Coursera) Dec. 2019

- Analyzed and visualized data in R and performed frequentist and Bayesian statistical inference

Air Quality Analysis & Prediction, KKBOX Screening Question May. 2019

- Analyzed time series data and predicted the air quality in the upcoming days
  - Performed exploratory data analysis and developed **RNN** models

Energy Consumption Analysis & Prediction for Household Planning, NCKU Jan. 2017

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

Mining Geo-Social Services for Optimal Location Placement, NCKU Nov. 2016

- Designed an algorithm to rank top locations for hotel and theater placement
  - Used hill climbing optimization algorithm with **NDCG** ranking scores

Social Relationship inference from Urban Footprint, NCKU Oct. 2016

- Designed an algorithm to predict whether people are friends on social media with 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

- **Microsoft Certified**: Azure Fundamentals

LEADERSHIP EXPERIENCE

President of Social Service Team, NCKU Sept. 2012 – Jun. 2013

- Visited and held service activities in Social Welfare Organizations
- Held summer and winter camps for rural primary school students