

TONGAN CAI

EDUCATION

- **Pennsylvania State University** University Park, PA
Ph.D. in Informatics – Advisor: James Z. Wang Aug. 2019 – Present
- **University of Michigan** GPA:3.66/4.00 Ann Arbor, MI
Bachelor of Science and Engineering in Data Science - Magna Cum Laude Sept. 2017 – May 2019
- **Shanghai Jiao Tong University** GPA:3.55/4.00 Shanghai, China
Bachelor of Science and Engineering in Electrical & Computer Engineering Sept. 2015 – Aug. 2019

RESEARCH EXPERIENCE & SELECTED COURSEWORK

- Pennsylvania State University – College of Information Sciences & Technology** University Park, PA
Graduate Research Assistant Aug. 2019 – Present
- Working on a project supported by Houston Methodist Hospital that aims to diagnose stroke based on a mobile device. Multiple computer vision and video processing methods are adopted and studied.
 - Conference paper “A Computational Framework of Intelligent Augmented Stroke Screening and Assessment (ISSA) Using Facial Video Data” submitted to *IEEE International Symposium on Biomedical Imaging (ISBI) 2020*.

- University of Michigan - MiCHAMP** Ann Arbor, MI
Researcher - Michigan integrated Center for Health Analytics & Medical Prediction Mar. 2018 – May. 2019
- Adopt machine learning models and statistical methods for manipulation of medical & clinical data, including Chronic Hepatitis C (HALT-C), National Health and Nutrition Examination Survey (NHANES), Medical Expenditure Panel Survey (MEPS), Inflammatory Bowel Diseases.
 - Piloted nationwide salary survey - DocDollars Survey in the purpose of better understand the discrepancy in salary for academic physicians. Help with geological analytic works in Hepatitis C situation in Michigan.

- University of Michigan - UMTRI** Ann Arbor, MI
Research Assistant – University of Michigan Transportation Research Institute Aug. 2018 – Dec. 2018
- Collaborating with statistical learning models (BART, RF, SuperLearner etc.), mining the relation between vehicle damage dataset from NHTSA and the corresponding passenger injury level. Through processing vehicle collision images from NHTSA, analyze the damage detail of the vehicle, including angle of collision and severity of damage, and predict the injury of passengers.

- Zhejiang University of Finance & Economics – School of Information** Hangzhou, Zhejiang, China
Researcher – National Natural Science Foundation of China project May. 2018 – July. 2018
*(Under project “*Personalized recommendation, self-adaptive composition and optimization of resource services for mass collaboration*” supported by National Natural Science Foundation of China)
- Develop imbalance learning idea and stacking ensemble model for anomaly detection, demonstrated it through public data sets—Wisconsin Breast Cancer Datasets for cancer classification and prediction.
 - Conference paper as first author “Breast Cancer Diagnosis Using Imbalanced Learning and Ensemble Method” accepted by 2018 3rd International Symposium of Mathematics and Computer Science with oral presentation, recommended and published on *Applied and Computational Mathematics*.

- University of Michigan – Deep Learning (EECS498 Winter 2019)** Ann Arbor, MI
- Design and implement a text & vision fused framework for academic paper rating by extracting both text data and image features in ICLR conference papers and doing combined classification.
 - Develop image/text multiclass classification based on implemented layer structures of RNN, LSTM and CNN.

- University of Michigan – Computer Vision (EECS442 Fall 2018)** Ann Arbor, MI
- Deploy pipeline of Webcam-image preprocessing-GAN generation for novel Facial Expression Generation System. Train the Generative Adversarial Network on CK and JAFFE datasets.
 - Customized image crawler for Flickr images and match with required image using SIFT descriptor and k-NN.

ADDITIONAL INFORMATION

Publications: Cai, T., He, H., Zhang, W. Breast Cancer Diagnosis Using Imbalanced Learning and Ensemble Method. *Applied and Computational Mathematics*. Vol. 7, No. 3, pp. 146-154.

Golbus, J. R.*, Cai, T.*, Najarian, D., Trumppower, B., Kao, T., Waljee, A. K., Nallamothu, B. K.. Determinants of Compensation for U.S. Academic Physicians: Does Gender Matter?. 2019 *AHA QCOR*

Skills: Python, C++/C, R, Java, HTML/CSS, LaTeX, SQL, MATLAB, SAS; PyTorch, TensorFlow, MapReduce/Hadoop; Data Mining, Machine (Statistical/Deep) Learning, Computer Vision, Network Analysis, Data Analytics

Language: English – Highly skilled working proficiency; Chinese – Native