Rui Zhang

ruizhang2004@gmail.com | (914) 602-3989 | https://sites.google.com/site/ruizhangsite/home-1

Education and Training

- Ph.D., School of Architecture, **Carnegie Mellon University, 2011**
- Master of Science, Environment Sci. & Engr. Department, **Tianjin University, 2006**
- Bachelor of Science Environment Sci. & Engr, double major in Computer Science, **Tianjin University, 2003**

Professional Experience

Research Scientist, IBM T.J. Watson Research Center, 2018

With deep analytical and real problem-solving skills, including deep learning, predictive modeling, time series forecasting, anomaly detection and big data analytics, contributing and leading the following projects in IBM's geo-spatial analytics platform -- Physical Analytics Integrated Data Repository and Services (PAIRS):

- Data intensive Deep Learning –
  - Implementing Spark and Hbase data pipeline solution for the task of translate high resolution aerial imageries into maps using Cycle-GAN based model.
  - A semi-supervise algorithm employing two networks, i.e. CycleGan, U-Net with incremental data augmentation was implemented and yielding accuracy comparable to SpaceNet winning solution utlizing inaccurate and incomplete public domain data.
  - An asynchronized decentralized parallel gradient descent algorithm was applied on the training of CycleGan, which speed up the training 14.7 times using a cluster of 16 GPUs.
- Solar Forecast – deep learning employing the latest GOES-R satellite data.
- Spark and Hbase based solution for batch export and pyramid generation on geo-spatial big data.

Founding Member and Senior R&D Engineer, Utopus Insights, 2017

- Leading a team on the demand forecast solution development on Hadoop platform.
- Utopus Insights was acquired by Vestas by $100M in 2017.

Research Staff Member, IBM T.J. Watson Research Center, 2014-2017

- Leading the development of serval key analytics for the energy and utility industry, including renewable forecasting, anomaly detection and time series analysis.

Selected Publications and Patents (30 publications, and 19 patents)

Complete publication list available at: https://sites.google.com/site/ruizhangsite/publications

- Zhang, Rui, Conrad Albrecht, Wei Zhang, Xiaodong Cui, Ulrich Finkler, David Kung, Siyuan Lu, Map Generation from Large Scale Incomplete and Inaccurate Data Labels, accepted as oral presentation at KDD 2020.
- Zhang, Rui, Minwei Feng, Wei Zhang, Siyuan Lu, Fei Wang, "Forecast of Solar Energy Production -- A Deep Learning Approach", International Conference on Big Knowledge, Nov. 17, 2018, Singapore.
- Zhang, Rui, Jefferson Huang, Tarun Kumar, "Preventive Leak Detection for High Pressure Gas Transmission Networks", AAAI-17 Workshop on AI and OR for Social Good, Feb. 4, 2017, San Francisco, California USA.
- Zhang, Rui, Hongxia Yang, "Dynamic Building Energy Consumption Forecast Using Weather Forecast Interpolations", 2015 IEEE International Conference on Smart Grid Communications (SmartGridComm), Miami, FL, 2015, pp. 671-676.
- Zhang, Rui, Tarun Kumar, Haijing Wang, "Data Driven Model for the Prediction of Expected Life Time of Transformer", Proceedings of the 2015 Winter Simulation Conference, Huntington Beach, CA, Dec. 6-9, 2015, p3154-3155.
- **US Patent 9,857,778:** Forecasting solar power generation using real-time power data, weather data, and complexity-based similarity factors.
- **US Patent App. 15/422,972:** Solar power forecast with volumetric convolutional neural network on 4 dimensional weather forecast

Awards and Honors

- IBM Fourth Patent Plateau (2016)
- IBM Outstanding Technical Achievement Awards (2016)
- IBM Eminence and Excellence Cash Award (2015)
- IBM Manager's Choice Award (2015)