Zheng Liu

Phone: 224-703-9606 • Email: zliu86@illinois.edu • Web: https://zhengliu9.github.io

SKILLS

Programming: Python, R, TensorFlow, Spark, C++, HTML/CSS, SQL, MATLAB, Amazon Web Service

EXPERIENCE

Data Science R&D intern, Civis Analytics, Summer 2018

Worked on a cross-functional team with data scientists and engineers to develop a product for record linkage and identity resolution.

- Researched, implemented, and evaluated methods for network analysis of person-record graphs.
- Designed and implemented a practical graph-based clustering pipeline to **cluster million-nodes graph**.
- Investigated **multi-layer graph embedding** using **Grassmann manifold learning**.
- Engaged in software engineering best practices such as unit testing, git version control, and code review.

Research assistant, University of Illinois at Urbana-Champaign, Urbana, IL, since 2015

Developed **reinforcement learning** (RL) algorithms for automated radiation source searching.

- Applied **RL (RNN + Q learning)** algorithms to navigate agents in radiation source searching tasks.
- Integrated a drone and a radiation detector into a radiation detection platform.
- Constructed real-time data streaming pipeline based on **Amazon Web Service**.

Developed machine learning algorithms for automated preclinical stereotactic neurosurgery platform.

- Implemented image segmentation and location detection with **Fully Convolutional Neural Networks**.
- Located anatomical points on rodent images (field of view: 12cm x 9cm) with locating error less than 500 um.

Developed machine learning and statistical inference algorithms for modeling background radiation.

- Predicted weather-induced background radiation fluctuation using **Recurrent Neural Networks**.
- Decoupled and estimated the background radiation's spatial distribution and temporal fluctuation using **Maximum Likelihood Estimation**.

Lead the project of *Internet of Things: Mobile Radiation Sensor Networks.*

- Lead a team of four to design, implement and test a real-time streaming system for sensor networks.
- Developed an Android App to communicate with detectors through BluetoothSocket and collect data.
- Implemented **Amazon Web Service** (**Kinesis Firehose, Redshift**) to stream, visualize and store data.

EDUCATION

University of Illinois — Urbana-Champaign, IL
PhD candidate, Nuclear, Plasma and Radiological Engineering, May 2019 (expected)

University of Illinois — Urbana-Champaign, IL
MS in Statistics, May 2018

University of Illinois — Urbana-Champaign, IL
MS in Nuclear, Plasma and Radiological Engineering, May 2016

University of Science and Technology of China — Hefei, China
Bachelor, Nuclear Engineering, June 2014

Related Courses

Machine Learning	Statistical Learning Theory	Big Data Optimization	Advanced Data Science
Game Theory	Big Graphs and Social Networks	Random Process	Multivariate Analysis

Publications

Zheng Liu, Gregory Romanchek, and Shiva Abbaszadeh. "Automated drones for radiation source searching with reinforcement learning." Symposium on Radiation Measurements and Applications (2018).

Zheng. Liu, Shiva Abbaszadeh, and Clair J. Sullivan, "Spatial-temporal modeling of background radiation using mobile sensor network data", PlosOne, under review.

Zheng Liu, and Clair J. Sullivan, "Prediction of weather induced background radiation fluctuation with recurrent neural networks." Radiation Physics and Chemistry (2018).

Zheng Liu, Hemmings Wu, and Shiva Abbaszadeh. "Automated location detection of injection site for preclinical stereotactic neurosurgery through fully convolutional network." Proc. SPIE 10576, Medical Imaging 2018: Image-Guided Procedures, Robotic Interventions, and Modeling, 1057623 (13 March 2018).