WEI GUO

Website: https://wguo.rbind.io
GitHub: https://github.com/w-guo
LinkedIn: https://www.linkedin.com/in/w-guo

U.S. Permanent Resident | Kirkland, WA | (206) 919-4085 | robustor@gmail.com

- 5+ years of experience in predictive modeling using machine /deep learning approaches with research experience in **topological data analysis (TDA)**
- Experience in managing large-scale data using HDFS and Amazon S3, and distributed computing using Spark and Hive

SKILLS

Programming Languages: Python, C/C++, R, SQL, Matlab

Software & Tools: Spark, Hive, Keras, PyTorch, Pandas, SciPy, Scikit-Learn, NLTK, ggplot2

RELEVANT PROJECTS

Customer Churn Prediction for Streaming Service using PySpark [Post] [GitHub] *Oct '20 – Nov '20*

- Built an end-to-end scalable machine learning pipeline with engineered user behavioral features using random forest classifier to identify customers at risk of churning
- Trained and evaluated large-scale model from 26M+ of log data on Amazon Elastic MapReduce (F1 score: 0.91)

Real-Time Disaster Response with Figure Eight [GitHub] *Sep '20 – Oct '20*

- Built an ETL pipeline to store categorized emergency messages in an SQLite database
- Created a machine learning pipeline for a web application using TF-IDF transformer and multiclass logistic regression to classify incoming messages (average F1 score: 0.94)

Deep Learning for Automated In-Process Inspection of Composite Layup (US Patent Application) [Featured on BARC website] [GitHub] *Apr '18 - Dec '19*

- Won **best presentation award** (presented by Dr. Agnes Blom-Schieber) in data analytics track at *2019 Boeing Tech Excellence Conference* as main contributor
- Developed semantic segmentation-based methods for visual inspections of tow boundaries that form the edges of the individual composite plies
- Trained a two-stage modified U-Net model to learn binary pixel-level segmentation
- Improved tow end detection accuracy from 88% using current software to > 99%

> *"Wei is a pleasure to work with. She is very detail-oriented, and she was very patient explaining details to non-experts like myself…She also does a good job documenting her work. If I were able to pick my own team I would not hesitate to hire Wei!"*
>
> - Agnes Blom-Schieber, Technical Fellow - Structures at Boeing

PROFESSIONAL EXPERIENCE

University of Washington, Seattle, WA [Google Scholar]
Research Assistant, Boeing Advanced Research Center (BARC) *Jan '16 – Dec '19*

- **Sparse Realization of TDA for Multi-Way Classification** [GitHub]
  - Presented a new method, a.k.a. Sparse-TDA, that incorporates sparse sampling to extract discriminative features in the presence of noisy and redundant information
  - Demonstrated its advantage over a state-of-the-art kernel TDA method (comparable accuracy / up to 98% training time reduction) and L_1-regularized feature selection methods (2%-8% accuracy increase / up to 73% training time reduction) on 3D meshes of synthetic and real human postures and textured images
- **Application of TDA in Manufacturing for Feature Selection and Causal Inference**
  - Mapped high-dimensional data to 2D space by MDS or *t*-SNE and cluster each subset in 2D space using DBSCAN to generate topological networks in the form of groups of clusters that compactly encode essential information of data
  - Extracted key process variables (features) that impact the output by performing statistical tests among subgroups of clusters from the topological network that display distinct patterns of data

EDUCATION

University of Washington, Seattle, WA
Ph.D., Industrial and Systems Engineering *Mar '20*
Relevant Coursework: Statistical Inference, Stochastic Modeling of Scientific Data, Nonparametric Regression and Classification, Statistical Computing, Convex Optimization, Design of Experiments
Data Science Training: Data Scientist Nanodegree (Udacity), Modern Big Data Analysis with SQL (Coursera/Cloudera), Deep Learning (Coursera/deeplearning.ai)

University of Minnesota, Twin Cities, Minneapolis, MN
M.S., Industrial and Systems Engineering *Apr '14*
M.S., Aerospace Engineering and Mechanics *Dec '10*

Harbin Institute of Technology, Harbin, China
M.S., Control Science and Engineering *Jul '08*
B.S., Control Science and Engineering *Jul '06*