SULYUN LEE

PhD Candidate

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in sulyunlee ⊙ SulyunLee 🌐 sulyunlee.github.io

SKILLS

- Machine Learning
- Deep Learning
- Database
- Data Mining
- Graph Mining
- Classification
- Clustering
- NLP
- Recommender System
- Social Network Analysis
- Predictive Modeling
- Language Modeling
- Data Visualization
- Data Preprocessing

MACHINE LEARNING ALGORITHMS

- Random Forest
- XGBoost
- AdaBoost
- Decision Tree
- Naive Bayes
- PCA
- Support Vector Machine
- Logistic Regression
- K Nearest Neighbors
- K-means Clustering
- Linear Regression

DEEP LEARNING ALGORITHMS

- GNN
- GCN
- GAT
- CNN
- RNN
- LSTM
- ANN
- Encoder-Decoder
- Autoencoder

NATURAL LANGUAGE PROCESSING

- BERT
- Transformer
- LDA
- Word2Vec
- Word Embedding

WORK EXPERIENCE

Statistical Consultant & Instructor | Iowa Social Science Research Center

📅 08/2019 – Present 📍 Iowa City, IA, USA

- Data Management and Analysis Workshop
- Network Analysis with NetworkX Workshop
- Introduction to Programming Workshop

Graduate Research Assistant | University of Iowa

📅 08/2017 – 05/2021 📍 Iowa City, IA, USA

- Achieved 40% gain on predicting the survival rate of heart attack patients on Medicare via a novel deep learning architecture for treatment optimization
- Predicted patient survival (AUC: 0.8) using Logistic Regression, Random Forest, SVM, and Neural Networks
- Validated the statistical significance in risks via regression analyses to communicate with health professionals with data-driven evidence

Undergraduate Research Assistant | Handong Global University

📅 06/2015 – 02/2017 📍 Pohang, South Korea

- Optimized classroom assignments to minimize students' travel distance
- Achieved 30% reduction in the total travel distance by using a genetic algorithm
- Translated a Python textbook by Prof. John V. Guttag from English to Korean

Graduate Teaching Assistant | University of Iowa

📅 08/2021 – Present 📍 Iowa City, IA, USA

- Course: Analyzing Data for Informatics

Undergraduate Teaching Assistant | Handong Global University

📅 02/2016 – 12/2016 📍 Pohang, South Korea

- Course: Introduction to Big Data
- Python Camp for university students

EDUCATION

Ph.D., Information Science | University of Iowa

📅 08/2017 – 05/2022 📍 Iowa City, IA, USA

B.S., Computer Science and Engineering | Handong Global University

📅 03/2013 – 02/2017 📍 Pohang, Korea

DATA SCIENCE PROJECTS

Representation Learning in Hierarchical Collaboration Networks | ⊙

PyTorch, Python

- Introduced a novel Graph Neural Network model that predicts team performance from hierarchical collaborations
- Achieved a 9% gain in predicting team success using the NFL coach dataset

Dynamic Embedding Learning using Autoencoder
PyTorch, Python

- Proposed an auto-encoding heterogeneous co-evolving dynamic neural network
- Achieved a 48% gain on the mortality risk prediction task

Team Success Prediction Among Research Scholars |
Python, Regression analyses, NLP

- Performed regression analyses and topic modeling to identify the collaborative patterns leading to scholars' team success
- Presented the increase of research team success by 50% with scholar's expertise using statistical tests

HIV/AIDS Prediction |
Python, Scikit-learn

- Proposed decreasing HIV/AIDS by 7% using Linear Regression and Random Forest when a policy is implemented
- Provided data-driven evidence of cost reduction and public health benefits

Link Prediction in an Online Health Community |
Python, Scikit-learn, Keras, NLP

- Achieved an 8% gain in predicting future interactions among online health community users with Logistic Regression, Random Forest, AdaBoost, and Neural Networks

Customer Satisfaction Prediction on Crowdfunding Platform |
Python, Regression analyses, Scikit-learn

- Predicted production delays (AUC: 0.9) of crowdfunding business from posts using Random Forest, AdaBoost, and XGBoost
- Suggested appropriate entrepreneurs' responses on delays for customer satisfaction

PUBLICATIONS

Sulyun Lee and K. Zhao. "Hierarchy2vec - Representation Learning in Hierarchical Collaboration Networks for Team Performance Prediction" *INFORMS Data Science Workshop*, 2021 (Best Paper)

Sulyun Lee, H. Jang, K. Zhao, M. Amato, and A. Graham. "Link Prediction in an Online Health Community for Smoking Cessation" *KDD workshop on Mining and Learning with Graphs*, 2020 | Paper

Sulyun Lee, H. Jang, K. Zhao, M. Amato, and A. Graham. "Multi-Relational Link Prediction for an Online Health Community" *INFORMS Data Science Workshop*, 2019 | Paper

L. A. Polgreen, N. Street, **Sulyun Lee**. "Treatment Combinations for Elderly Patients and Those With Comorbidities After an Acute Myocardial Infarction" Circulation, 2019 | Link

HONORS AND AWARDS

Best Paper Award Nominee | INFORMS Data Science Workshop

📅 11/2021

Ballard & Seashore Dissertation Fellowship | Graduate College

📅 02/2022 – 06/2022

Graduate Fellowship | Interdisciplinary Graduate Program in Informatics

📅 09/2020 – 08/2021