Mohammad Fili

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Profile

Ph.D. student in the Department of Industrial & Manufacturing Systems Engineering (IMSE), and M.Sc. student in statistics at Iowa State University (ISU). Interested in machine learning theory & applications, data analytics and optimization.

Education

Ph.D. (Industrial Engineering)
Iowa State University (ISU) | Ames, IA, USA | 2019-present
- Major Professor: Dr. Guiping Hu
- Qualifying Exam: A new classification method based on dynamic ensemble selection and its application to predict variance patterns in HIV-1 Env

M.Sc. (Statistics)
Iowa State University (ISU) | Ames, IA, USA | 2020-present
- Major Professor: Dr. Kris De Brabanter

M.Sc. (Industrial Engineering)
Sharif University of Technology (SUT) | Tehran, Iran | 2016-2018
- Major Professor: Dr. Majid Khedmati
- Thesis: Trip time prediction for yellow taxis in NYC using machine learning

B.Sc. (Industrial Engineering)
Iran University of Science & Technology (IUST) | Tehran, Iran | 2012-2016
- Major Professor: Dr. Mohammad Ali Shafia
- Final Project: Estimating the needed drivers for Clickpeyk Co. via scenario building using a discrete-event simulation model

Research Interests

- Machine Learning
- Data Analytics
- Statistical Analysis
- Optimization

Programming

- Python
- R
- SAS
- MATLAB

Softwares

- CPLEX
- Minitab
- Arena

Achievements

- Finalist in XPRIZE competition: Pandemic response challenge (2021)
- 3rd best student paper award at Informs conference on service science (2021)

Publications

Peer-Reviewed Journal Articles in Print

- Van Ert, H. A., Bohan, D. W., Rogers, K., **Fili, M.**, Rojas Chávez, R. A., Qing, E., ... & Haim, H. (2021). Limited variation between SARS-CoV-2-infected individuals in domain specificity and relative potency of the antibody response against the spike glycoprotein. Microbiology Spectrum, 10(1), e02676-21.
- **Fili, M.**, & Khedmati, M. (2020). Town trip forecasting based on data mining techniques. *Journal of Industrial Engineering, International*, 16(1), 1-13.

Peer-Reviewed Journal Articles in Press

- None

Peer-Reviewed Journal Articles in Review

- **Fili, M.**, Mohammadiarvejeh, P., & Hu. G. (2022). A Stacking-based Classification Method to Predict ICU Admission in Hospitalized COVID-19 Patients. *Artificial Intelligence in Medicine*.
- **Fili, M.**, Hu, G., Han, C., Kort, A., Trettin, J., & Haim, H. A new classification method based on dynamic ensemble selection and its application to predict variance patterns in HIV-1 Env. *Computer Methods and Programs in Biomedicine*.
- Rojas Chávez, R. A., **Fili, M.**, Han, C., Rahman, S. A., Bicar, I. G. L., Hu, G., Das, J., Brown, G. D., & Haim, H. (2022). Patterns of Volatility Across the Spike Protein Accurately Predict the Emergence of Mutations within SARS-CoV-2 Lineages. *BioRxiv*, 2022.02.01.478697. https://doi.org/10.1101/2022.02.01.478697
- Bi, L., **Fili, M.**, & Hu, G. COVID-19 forecasting and intervention plan optimization using gated recurrent unit and evolutionary algorithm. *Neural Computing and Applications*.

Manuscripts in Preparation

- Covid-19 policy prescription using Bayesian Optimization
- Application of Machine Learning in Predicting Product Success in a Convenient Store

Conference Papers:

- Bi, L., **Fili, M.**, & Hu, G. (2021, August). Covid-19 Intervention Policy Optimization Using a Multi-population Evolutionary Algorithm. In INFORMS International Conference on Service Science (pp. 383-396). Springer, Cham.
- **Fili, M.**, Hu, G., Han, C., Kort, A., & Haim, H. (2020, December). A Stacking-Based Classification Approach: Case Study in Volatility Prediction of HIV-1. In INFORMS International Conference on Service Science (pp. 355-365). Springer, Cham.

Research Experiences

- Graduate Research Assistant, IMSE Dept., ISU (2019-present)

- Supervise a Graduate Student from UC Davis, IMSE Dept., ISU (Summer 2021- Spring 2022)
  - Developing Literature Review
  - Exploratory Data Analysis & Visualization
  - Conceptual Modeling for Covid-19 Intervention Policies' Costs
- Supervise an Undergraduate Research Assistant, IMSE Dept., ISU (Spring 2021)
  - Developing Literature Review
  - Designing Cost Matrices of Mitigation Policies for Covid-19
- Supervise an Undergraduate Research Assistant, IMSE Dept., ISU (Fall 2020)
  - Clustering Analysis
  - Evaluation of Different Base Classifiers
  - Developing Literature Review
- Summer Project, IMSE Dept., ISU, (Summer 2020)
  - Assist with a Book Chapter: "Forecasting and Industrial Applications" Chapter of the Maynard's Handbook of ISE
- Supervise an Undergraduate Research Assistant, IMSE Dept., ISU (Spring 2020)
  - Developing Literature Review
- Supervise an Undergraduate Research Assistant, IMSE Dept., ISU (Summer 2020)
  - Developing Literature Review

Grants

- "Deep learning methods to personalize antibody therapeutics for delaying viral rebound after cessation of ART"
  PI: Dr. Hillel Haim (University of Iowa)
  Granting Agency: American Foundation for AIDS Research (amfAR)
  Amount: $150,000
  Grant No. 110028-67-RGRL
  Project Duration: 10/01/20 – 09/30/21
  Role: Research Assistant: Data Analysis, Conceptualization, Figure Preparation, and Providing Analytical Outputs for the Proposal.

Presentations

- A Stacking-based Classification Approach: Case Study in Volatility Prediction of HIV-1 Viruses, Informs ICSS Conference, 2020
- Covid-19 Intervention Policy Optimization for the United States Using a Multi-Population Evolutionary Algorithm, Informs ICSS Conference, 2021

Teaching Experiences

- Teaching Assistant, IE-361: Statistical Quality Assurance, IMSE Dept., ISU (Fall 2021 & Spring 2022)
  - Give Lectures
  - Conduct Review Sessions
  - Assist Students during Lab Sessions
  - Design Assignment/Questions
  - Set up and Prepare Lab Sessions
  - Grade Homework/Labs/Exams
- Teaching R Shiny, IE-587: Big Data Analytics and Optimization, IMSE Dept., ISU (Spring 2020)
  - Teach a One-Session Class: "Dashboard Visualization using R Shiny" for Big Data Class
- Teaching Assistant, IE-361: Statistical Quality Assurance, IMSE Dept., ISU (Spring 2019)
  - Assist Students during Lab Sessions
  - Set up and Prepare Lab Sessions
  - Grade Homework/Labs/Exams
  - Proctor Exams
- Teaching Assistant, Data Mining, IE Dept., SUT (Spring 2017)
  - Teach R Language for Data Wrangling, Exploratory Analysis, and Visualization.
- Teaching Assistant, Probability and Statistics, Aerospace Eng. Dept., SUT (Spring 2017)
  - Solve sample questions for students
- Teaching Assistant, Design of Experiments, IE Dept., SUT (Fall 2016)
  - Solve sample questions for students
  - Give Summary Lectures

Service

Reviewed Papers:

- *Expert Systems* (1)
- *Frontiers in Public Health (1)*
- *Mathematics (1)*

Membership

- Member of Institute of Industrial and Systems Engineers (IISE)
- Member of Institute for Operations Research and the Management Sciences (Informs)
- Member of American Statistical Association (ASA)
- Member of Statistics in Community (STATCOM) at Iowa State University

Professional Development

- Python Programmer Track Certificate | Data Camp | 58 Hours
- Data Scientist with R Track Certificate | Data Camp | 97 Hours
- Data Analyst with R Track Certificate| Data Camp | 64 Hours
- Fundamentals of Accelerated Data Science with RAPIDS | NVIDIA

References

- Guiping Hu
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  Iowa State University
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  (515) 294-8638

- Gary Mirka
  Professor
  Iowa State University
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- Hillel Haim
  Assistant Professor
  University of Iowa
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- Qing Li
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