AREZOO KHALILI

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Toronto, ON

MOTIVATION

Innovative Ph.D. in Engineering with a focus on experimental project design and analytics, showcasing expertise in extracting valuable insights from complex datasets. My passion for adding tangible value to teams and businesses through creative problem-solving, coupled with a proven ability to solve complex problems and a commitment to continuous learning, drives my motivation to transition to a dynamic role in data science.

CAREER SUMMARY

Data Science in Training and Household Manager (Career Break for Maternity Leave)

Home Feb 2023 – Present Toronto, Canada

- Applied Machine Learning skills to enhance the operational understanding of a virtual grocery store, contributing to the establishment of a data-driven business.
- Strengthened problem-solving, resilience, empathy, flexibility, and crisis management skills during a career break for maternity leave.

Postdoctoral Visitor

York University June 2022 – Feb 2023 Toronto, Canada

- Led the design of a low-cost portable microfluidic biosensor for SARS-COV-2 virus detection, showcasing engineering expertise.
- Collaborated cross-functionally to provide engineering support, ensuring timely project delivery within budget constraints.
- Delivered comprehensive project progress reports, composed proposals, and secured grants for ongoing research initiatives.

Researcher in Engineering with a Focus on Experimental Design and Analysis

York University Sep 2017 – May 2022 Toronto, Canada

- Designed, fabricated, and tested integrated, low-cost, high-throughput microfluidic devices for monitoring zebrafish larvae's behavioral responses, contributing to neurodegeneration research.
- Analyzed experimental data using statistical methods, providing valuable insights to enhance device performance.
- Implemented data visualization techniques for clear communication of research findings with stakeholders.
- Mentored MASc and BSc students, contributing to their academic and research growth.

Lecturer: (Faculty Member- Undergraduate Director of Mechanical Engineering Group)

Azad University Sep 2008 – Sep 2017 Saveh, Iran

- Taught undergraduate mechanical engineering courses, providing quality education to aspiring engineers.
- Directed the undergraduate mechanical engineering group, overseeing academic programs, curriculum planning, and implementing data-driven approaches for program assessment.

DATA SCIENCE PROJECTS

- **Assessing Campaign Performance in Promoting a Delivery Service Using Chi-Square Test for Independence:**
  - Utilized the **Chi-Square test** to analyze whether the signup rate of a grocery retailer's customers varies depending on the type of mailer (low-cost or high-cost) received, enabling the client to make data-driven decisions for future campaigns.
- **Predicting Customer Loyalty for a Grocery Retailer:**
  - Built a predictive model to find the relationships between the metrics of a grocery retailer's customers and their loyalty score using Linear Regression, Decision Tree, and Random Forest.
  - Achieved the highest predictive accuracy with Random Forest, improving customer communications.
- **Enhancing Targeting Accuracy:**
  - Developed a model predicting the probability of customers signing up for a new delivery service offered by a grocery retailer store.
  - Implemented Logistic Regression, Decision Tree, Random Forest, and K Nearest Neighbours (KNN).
  - Chose Random Forest for its consistent performance on the test set across classification accuracy, precision, recall, and f1-score, enabling accurate targeting.
- **You Are What You Eat" Customer Segmentation:**
  - Utilized k-means clustering on grocery transaction data for customer segmentation.
  - Enhanced targeted content and promotions based on distinct "shopper types."
- **Compressing Feature Space for Classification Using PCA:**
  - Applied **PCA** to compress 100 unlabelled, sparse features into a manageable set for classification.
  - Trained a Random Forest Classifier with a classification accuracy of 93%.
- **Understanding Alcohol Product Relationships Using Association Rule Learning:**
  - Applied **Apriori for association rule learning** to analyze the relationships between different products in the alcohol section of a grocery store.
  - guided the marketing team to put some products together and run "bundled" promotions.
- Developed and implemented predictive models to identify at-risk students and recommend tailored interventions.
- Collaborated with faculty to create a data-driven approach for optimizing course prerequisites.

SKILLS AND TOOLS

- **Programming:** Python (Base, Pandas, Numpy, Matplotlib, Scikit-Learn, Keras), SQL, Matlab
- **Machine Learning:** Linear Regression, Logistic Regression, Decision Trees, Random Forest, KNN, k-means, PCA, Association Rule Learning, Causal Impact Analysis
- **Other:** Statistics, Github, Data Visualisation, Jupyter Notebook, Spyder Notebook, Ansys, SolidWorks, AutoCAD, ImageJ, MS Office

CERTIFICATES

- **Data Science Professional**
  Data Science Infinity, England, 2023
- **Research and Development Management**
  Mitacs, Canada, 2022
- **Data Science**
  Lantern Institute, Canada, 2021
- **Building Mechanical Installations Supervision (Grade 2)**
  Department of Housing and Urban Development, Iran, 2013
- **MATLAB**
  Amirkabir University of Technology, Iran, 2006

ACHIEVEMENTS

- **CSME Gold Medal Award at the PhD level**
  York University, 2023
- **Nominated for PhD Best Thesis Award**
  York University, 2022
- **Mitacs Accelerate Research Award**
  York University, 2022
- **Kostas Tsotsos Graduate Award**
  York University, 2022
- **Susan Mann Dissertation Scholarship**
  York University, 2021
- **Mechanical Engineering Teaching Excellence Award**
  York University, 2021
- **Mechanical Engineering Excellence Award for Graduate Research**
  York University, 2019, 2020, 2021
- **Ontario Graduate Scholarship**
  York University, 2018, 2019, 2020
- **Parya Scholarship**
  York University, 2019
- **York Graduate Scholarship**
  York University, 2017
- **Carswell Scholarship**
  York University, 2017
- **Roderick Guthrie Graduate Scholarship**
  York University, 2017
- **RA, TA and Fellowship**
  York University, 2017-2021

STRENGTHS

- Excellent Communication Skills
- Strong Leadership Skills
- Self-Motivated
- Adaptive
- Team-Player
- Task-Oriented
- Problem-Solver
- Fast-Learner

EDUCATION

PhD in Mechanical Engineering
York University 2017 – 2022 Toronto, Canada

MASc in Mechanical Engineering
Amirkabir University 2005 – 2008 Tehran, Iran

RECENT PUBLICATIONS

- Loss of Panx1 Function in Zebrafish Alters Motor Behavior in a Lab-on-Chip Model of Parkinson's Disease
  Khalili et al., J. of Neuroscience Research, 2023
- Simple Microfluidic Device for Simultaneous Extraction and Detection of Microplastics in Water using DC Electrical Signal
  Zabihihesari, Khalili et al., New J. of Chemistry, 2023
- Simultaneous Screening of Zebrafish Larvae Cardiac and Respiratory Functions: A Microfluidic Multi-phenotypic Approach
  Khalili et al., J. of Integrative Biology, 2022
- Dopaminergic signaling regulates zebrafish larvae's response to electricity
  Khalili et al., Biotechnology J., 2022
- Designing Microfluidic Devices for Behavioral Screening of Multiple Zebrafish Larvae
  Khalili et al., Biotechnology J., 2021
- Zebrafish Larva's Response to Electric Signal: Effects of Voltage, Current, and Pulsation for Habituation Studies
  Khalili et al., J. of Sensors and Actuators: A. Physical, 2021
- Open Access Tool and Microfluidic Devices for Phenotypic Quantification of Heart Function of Intact Fruit Fly and Zebrafish Larvae
  Zabihihesari, Khalili et al., J. of Computers in Biology and Medicine, 2021
- Multi-Phenotypic and Bi-Directional Behavioral Screening of Zebrafish Larvae
  Khalili et al., J. of Integrative Biology, 2020
- Phenotypic Chemical and Mutant Screening of Zebrafish Larvae using an On-Demand Response to Electric Stimulation
  Khalili et al., J. of Integrative Biology, 2020

VOLUNTEER ACTIVITIES

- Executive Member, Graduate Learning, Curriculum, and Students (GLCS) Committee
  - Lassonde School of Engineering, York University, Canada (2021-2022)
- Executive member, Adjudicating Committee
  - Department of Mechanical Engineering, York University, Canada (2020-2021)
- Executive member, Mechanical Engineering Graduate Students' Association (MEGSA)
  - York University, Canada (2020-2021)
- Mentor of undergraduate and high school students
  - York University, Canada (2018-2022)
- Executive member, Canadian Society of Mechanical Engineering (CSME) Conference,
  - York University, Canada (2018)