

Anna Jazayeri

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SUMMARY

Passionate and detail-oriented Data Science and Analytics student at Seneca Polytechnic, consistently maintaining a 4.0 GPA. Brings an interdisciplinary background in law and social sciences, offering a unique lens to data-driven problem solving, particularly in addressing complex social challenges. Research interests include information retrieval, social network analytics, fairness in AI, and unsupervised learning. Proficient in Python, R, SQL, Power BI, and TensorFlow, with hands-on experience developing machine learning models and interactive dashboards. Committed to building transparent, unbiased AI systems that promote equity and support evidence-based decision-making across public and private sectors.

EDUCATION

Master of Data Science University of Toronto	2025 - 2027 Ontario, Canada
Bachelor of Data Science and Analytics Seneca Polytechnic <i>GPA: 3.96 (out of 4.00)</i>	2021 - 2025 Ontario, Canada
Master of International Law University of Tehran	2016 - 2018 Tehran, Iran
Dual bachelor's degree in Social Science and Law Shahid Beheshti University	2012 - 2016 Tehran, Iran

RESEARCH INTERESTS

- **Information Retrieval:** Developing algorithms that significantly enhance the efficiency, accuracy, and relevance of information retrieval processes.
- **Social Network Analytics:** Studying structures, behaviors, and information dissemination patterns within social networks and online communities.
- **Social Media Mining:** Utilizing data mining techniques to gain insights from social media content, influencing decision-making across various sectors.
- **Applied Artificial Intelligence:** Integrating sophisticated AI techniques into real-world applications to enhance system performance and effectively address practical challenges.

- **Social Impact of Algorithmic Bias:** Investigating the societal effects of bias in AI, emphasizing the implications for marginalized communities, social justice, and equity.
- **Computational Social Science:** Employing data-driven methods to better understand complex social phenomena, behaviors, and dynamics.
- **Applied Data Science:** Developing practical data-driven solutions for pressing social issues, facilitating evidence-based decision-making processes.
- **Fairness in AI Algorithms:** Creating transparent methodologies to identify and mitigate biases in machine learning models, ensuring equitable outcomes across diverse groups.
- **Bias Detection and Mitigation Techniques:** Formulating innovative strategies for detecting and reducing bias at all stages (pre-processing, in-processing, and post-processing) in AI systems.
- **Fair Representation Learning:** Exploring techniques for generating unbiased representations from social data, considering disparities inherent in the data sources.

RESEARCH EXPERIENCE

Unsupervised Feature Selection Using Orthogonally Constrained Matrix Factorization with Hessian Regularization and Non-Convex Sparsity 2025

Accepted to the 38th Canadian Conference on Artificial Intelligence

Seneca Applied Research, Research Group

- Developed a novel feature selection method integrating orthogonally constrained matrix factorization, Hessian regularization, and non-convex sparsity.
- Enhanced clustering performance and feature selection by preserving local data structures and reducing dimensionality in high-dimensional, unlabeled datasets.
- Empirically validated the method on multiple datasets, achieving competitive clustering accuracy and normalized mutual information.

DBNMI-VAE: Dropout and Batch Normalization with Mutual Information Consideration for Variational Autoencoders 2025

Submitted to the 38th Canadian Conference on Artificial Intelligence

Seneca Applied Research, Research Group

- Proposed an enhanced Variational Autoencoder (VAE) model incorporating dropout, batch normalization, and mutual information to mitigate posterior collapse and the hole problem.
- Demonstrated superior training and validation performance, improving generative modeling and latent representation learning.
- Outperformed baseline VAEs by achieving lower training and validation losses, ensuring more informative and structured latent representations.

Impact of socioeconomic and demographic factors on mental health in Canada 2024

Seneca Polytechnic, Course Project

Currently analyzing the influence of various socioeconomic and demographic factors on mental health outcomes using a large-scale dataset from the 2022 Mental Health and Access to Care Survey. The project involves ongoing data preprocessing, statistical analysis, and model building with Python to uncover correlations and trends. The goal is to present findings on how factors

such as income, age, and education impact mental health, supporting evidence-based policy recommendations.

Brain Tumor Detection Using Deep Learning

2024

Seneca Polytechnic, Course Project

Developed a brain tumor detection model based on the VGG16 architecture, utilizing MRI scans to identify tumors with 82% validation accuracy. Applied data augmentation and transfer learning techniques to enhance model performance and improve generalization on unseen data.

HR Demographics Analysis and Workforce Insights Using Power BI

2024

Department of National Defence, Internship Project

Conducted an analysis of HR employment demographic data, using Power BI to develop interactive dashboards that showcased workforce diversity across age, gender, role, and location. Presented findings to stakeholders, providing insights into demographic trends and patterns to support data-driven HR planning, recruitment strategies, and diversity initiatives.

WORK EXPERIENCE

Research Assistant – Hybrid

2024 – 2025

Seneca Applied Research

Ontario, Canada

Conducted research on improving Variational Autoencoders (VAEs) by addressing key limitations such as posterior collapse and the hole problem. Contributed to the design and implementation of a model integrating dropout, batch normalization, and mutual information regularization.

Software Developer – Internship, Contract

2024

Department of National Defence

Ontario, Canada

Developed and implemented Power Apps, Power Automate, and Power BI solutions, reducing processing times by 80%, manual tasks by 95%, and improving operational efficiency in HR, IT, and medical workflows.

Customer Service – Permanent, Full-Time

2018 – 2020

Tim Hortons Inc.

Ontario, Canada

Provided exceptional customer service, ensured order accuracy, collaborated with team members, and resolved customer complaints efficiently.

TECHNICAL SKILLS

- Programming Languages: Python, R, SQL, HTML, JavaScript, CSS
- Python libraries: Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, TensorFlow, Keras, SimPy, NLTK and more.
- R libraries: Dplyr, ggplot2, Shiny, Caret, RMarkdown, Knitr
- Data Visualization: Power BI, Tableau, QlikView, Qlik Sense
- Database Management: MongoDB, Oracle SQL, Microsoft Access, Microsoft Azure
- Machine Learning: Logistic Regression, Decision Trees, Random Forest, Support Vector Machines (SVM), Clustering (K-Means), CNNs, Neural Networks, LDA (Topic Modeling)

- Deep Learning: Convolutional Neural Networks (CNNs), Transfer Learning, Data Augmentation
- Automation & Workflow Tools: Power Apps, Power Automate, SharePoint
- Other Tools: GitHub, Microsoft Excel, Microsoft Visual Studio Code, SPSS

AWARD & HONORS

President's Honors List

2021 – 2025

Awarded each academic term for maintaining exceptional academic standing in the Bachelor of Data Science and Analytics program.

McLean Foundation Award

2025

Awarded to a top student in the Faculty of Applied Science and Engineering Technology for outstanding academic excellence (GPA 4.0). Recognized for a demonstrated passion for research, creative problem-solving, and innovative thinking in applied science and technology.

Certificate of Appreciation

2024

Presented in recognition of meaningful contributions as a Software Developer Intern supporting the 4th Canadian Division/Joint Task Force (Central) Headquarters in advancing Canada's national defense and security initiatives.

Amsdell Scholarship

2024

Awarded for academic excellence and leadership in the School of Software Design & Data Science. Selected by faculty for exemplary performance and dedication to the data science and analytics discipline.

CERTIFICATE

Generative Deep Learning with TensorFlow

2024

DeepLearning.AI | Issued December 2024

Credential ID: KYAKXMN143OQ

Covered TensorFlow, Generative Adversarial Networks (GANs), and advanced deep learning techniques for generative modeling.

Diploma of Administrative Assistant with Desktop Publishing

2020 – 2021

Academy of Computer and Employment Skills

Ontario, Canada

Grade: ADV (Advanced Standing Granted)