Avesta **Ahmadi**
Computational Scientist

About me

● Experienced Computational Scientist (5+ years), consistently making a meaningful impact in various work environments as a researcher and engineer.

● Proficient in utilizing computational and advanced analytical tools to address real-world challenges via data-driven and evidence-based research, deriving impactful solutions by generating value from data, and contributing to the growth of the organization.

● Adept in analytical thinking, demonstrating the ability to identify problems, formulate effective solutions, and successfully implement them.

Areas of specialization

● Mathematical Modeling including Machine Learning, Data Science, Optimization, Inverse Modeling, Predictive Modeling, Statistical Learning, and Supervised and Unsupervised Learning.

● Data Visualization and Exploratory Analysis by Matplotlib, Folium, and ggplot2.

● Time-Series Forecasting by physical modeling or Deep Learning, including different architects of Neural Networks such as DNN, RNN, CNN, and LSTM.

● Computing and coding skills such as Parallel Computing, object-oriented programming, Algorithm Design via MATLAB and Python.

● Proficient in computational packages such as Pandas, Numpy, Scipy, Matplotlib, Scikitlearn, Jupyter, Keras, Tensorflow, and writing SQL queries.

● Deep understanding of regression, classification and clustering techniques and familiarity with Cloud infrastructures and Github.

Extra Curricular

● President of SIAM Chapter - McMaster University - volunteer work - organizing seminars.

● Graduate Ambassador for CSE Program - volunteer work - promoting CSE school

- Linkedin
- Github
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PROFESSIONAL EXPERIENCE

Computational Scientist
GENERAL MOTORS INC. & MCMASTER UNIVERSITY
09/18 – 09/24
📍 Ontario, CA

● Conducted extensive scientific research related to characterizing the behavior and dynamics of Li-ion cells.

● Applied scientific computing and predictive modeling routines to solve intricate computational problems associated with dynamical systems.

● Applied mathematical modeling, physical modeling, machine learning, inverse modeling, and optimization techniques to learn optimal dynamics of a system in the form of either a parametric or non-parameteric function, from data.

● Developed time-series models focused on learning and predicting specific dynamics of the system.

● Utilized both deterministic and probabilistic optimization techniques for solving inverse problems. ● Overcame complex research challenges by employing critical thinking to design creative and innovative solutions, analyzed the results of the models to inform insights.

● *Technical Skills: Data-Driven Learning, Inverse Modeling, Parameter Estimation, Bayesian Inference, Optimization, Numerical Modeling, MATLAB, Optimal Reconstruction of Continuous Functions.*

Data Scientist & Researcher
PULSENICS INC.
02/22 – 01/23
📍 Ontario, CA

● Leveraged data-driven model discovery and system identification techniques to model time-series data by finding an optimal parametric form of dynamics governing the system, using the SINDy framework and sparse regression techniques, focused on interpretable and scalable dynamic models. ● Enhanced the estimations of cell internal behavior using feedback loops and filtering techniques, applicable to prediction and control.

● Planned and organized research meetings with Pulsenics' team and their clients, closely collaborated with the team to run experiments on industrial cells and come up with solution approaches that address business objectives of their partners, demonstrated adaptability in the fast-paced startup environment by flexibly adjusting research directions, voluntarily engaged in new research projects to support the company's evolving needs, effectively communicated the analytics approach, and delivered research progress consistently and efficiently.

● *Technical Skills: Interpretable Machine-Learning, Sparse Regression, SINDy, Kalman Filtering, Dimensionality Reduction, Principle Component Analysis, Python, Pandas, Numpy, Scipy, Sklearn*

Research Assistant
MCMASTER UNIVERSITY
09/18 – 08/20
📍 Ontario, CA

● Optimized the pseudo-energy of a system to find lattice structure via Integer Programming and heuristics techniques.

● Time-series forecasting of stock data based on classical and deep learning models, and outlier detection.

● *Technical Skills: Deep learning, Neural Networks, ARIMA, Python, Principal Component Regression, TensorFlow, Keras, Integer Programming.*

Teaching Assistant
MCMASTER UNIVERSITY
09/18 – 08/24
📍 Ontario, CA

● Worked as a teaching assistant, mentoring undergraduate mathematics and engineering students.

● Skills: Transferring Knowledge, Effective Communication Skills, Teaching Skills.

Senior Wireline Field Engineer
SCHLUMBERGER
07/16 – 07/18
📍 Iran

● Enhanced the revenue of the company by successfully delivering more than 30 Wireline jobs to the clients (net value of $100,000 to $700,000 each).

● Planned and organized Wireline procedures, led a Wireline crew, and effectively communicated with clients to ensure seamless execution and high-quality data delivery.

● Demonstrated efficiency in executing Wireline jobs in harsh and stressful conditions for extended hours.

EDUCATION

Ph.D. — **Computational Sci. & Eng.**
McMaster University 🏛
2020-2024

M.Sc. — **Computational Sci. & Eng.**
McMaster University 🏛
2018-2020

B.Sc. — **Chemical Engineering**
Sharif University 🏛
2010-2015

PUBLICATIONS

2022 — Data-Driven Optimal Closures for Mean-Cluster Models: Beyond the Classical Pair Approximation DOI.

2024 — Data-Driven Approach to Learning Optimal Forms of Constitutive Relations in Models Describing Lithium Plating in Battery Cells DOI.