

MOHAMMADALI AMERI FARD NASRAND

Curriculum Vitae

PERSONAL AND CONTACT INFORMATION

First Name: **MohammadAli**

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Last Name: **Ameri Fard Nasrand**

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Birth Date: **5/ 26 / 1996**

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Hometown: **Edmonton**

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SUMMARY

Ph.D. candidate in Structural Engineering at the University of Alberta with expertise in risk and reliability analysis, numerical modeling, and pipeline integrity. Experienced in risk-based inspection and maintenance planning, integrating Bayesian decision analysis, reinforcement learning, and probabilistic methods. Strong background in structural health monitoring, finite element analysis (FEA), and predictive modeling for pipeline degradation under stress corrosion cracking (SCC) and fatigue growth. Proven ability to collaborate on industry-focused research, publish in high-impact journals, and develop AI-driven solutions for pipeline integrity management.

EDUCATION

University of Alberta, Canada

Sep 2021 - Present

PhD Student, Structural Engineering

Overall GPA: 3.9/4

Sharif University of Technology, Iran

Sep 2018 - Jan 2021

M.Sc., Structural Engineering

GPA: 17.86/20 (4/4)

Department of Civil Engineering

(Top 15%)

Sharif University of Technology, Iran

Sep 2014 - Sep 2018

B.Sc., Civil Engineering

GPA: 17.23/20 (3.75/4)

Department of Civil Engineering

(Top 20%, Honor Student)

TECHNICAL STRENGTHS

Pipeline Risk Management

API 580/581, API 579, CSA Z662, RBI Planning

Structural Design

Sap, Safe, Etabs, AutoCad, Revit, Opensees, Abaqus

Structural Health Monitoring

Kalman Filter, Bayesian Model Selection

Programming

Python, Matlab (professional)

WORK EXPERIENCE

Ph.D. Researcher at the University of Alberta

Sep 2021 – Present

- **Ph.D. Project:** *Risk-Based Inspection and Maintenance Planning for Pipeline Integrity Management against Cracks* (Supervisor: Prof. Yong Li)
- Developed decision-making frameworks in Python, integrating Bayesian analysis, reinforcement learning, and reliability-based optimization to enhance pipeline integrity management.
- Performed probabilistic failure analysis using Monte Carlo simulation and FORM/SORM methods to assess reliability under stress corrosion cracking (SCC) and fatigue.
- Built Python-based predictive models for pipeline maintenance scheduling, combining statistical analysis with AI-driven optimization.

- Optimized inspection intervals and repair thresholds using Value of Information (VoI) and cost–benefit analysis under uncertainty.
- Collaborating with Prof. AdeeB on parallelized Monte Carlo sampling for structural reliability using MecSimCalc.¹
- **Lab2Market Program:** Participated in entrepreneurship training focused on translating academic research into practice through customer discovery, market analysis, and business model development for pipeline integrity management software.

M.Sc. Researcher at Sharif Univesity

Sep 2018 – Aug 2021

- **M.Sc. Project:** *Probabilistic Structural Health Monitoring for Rapid Damage Detection after Earthquakes* (Supervisor: Prof. Mahsuli)
- Designed a Bayesian-based framework in MATLAB for probabilistic system identification and rapid post-earthquake damage detection.
- Integrated sensor and mobile data to support real-time decision-making in intelligent emergency response systems.
- Modeled and analyzed different concrete and steel structures in SAP2000 and ETABS to evaluate damage potential under seismic excitations.
- Contributed to developing probabilistic models that improved regional emergency resource allocation and resilience planning.

Internship – Municipality of Tehran

Jul 2018 – Sep 2018

- Gained practical experience in site supervision, quantity estimation, labor management, and construction safety compliance.
- Supported project design and documentation processes for municipal infrastructure development.
- Checked and validated structural designs in ETABS and AutoCAD.

TEACHING ASSISTANTSHIPS

Statics/Dynamics/Math 102 at ESSC, UofA	Sep 2022 - Present
Co-up Marker, UofA	April 2025
Numerical Methods for Engineers	Jan-Apr 2022
Resilience of Infrastructures	Feb-Jun 2020
Introduction to Earthquake Engineering	Feb-Jun 2020
Concrete Technology Laboratory	Sep-Dec 2017

RESEARCH INTERESTS

Structural Health Monitoring	Pipeline Risk Management	Value of Information
Reinforcement Learning	Bayesian Decision Theory	Resilience of Infrastructures

PUBLICATIONS

Journal Papers:

- 1) M.A Ameri Fard Nasrand, M. Mahsuli, S. F. Ghahari, E. Taciroglu, "Bayesian Model Selection Considering Model Complexity Using the Extended Kalman Filter", *Earthquake Engineering and Structural Dynamics*, 2023. doi.org/10.1002/eqe.3915

¹<https://docs.mecsimcalc.com/advanced-applications/mp-monte-carlo>

- 2) M.A Ameri Fard Nasrand, Y. Li, "Value of Information Analysis for Immediate Inspection and Maintenance Pipe Cracks", *ASCE Journal of Pipeline Systems Engineering and Practice*, 2024. (To be submitted)
- 3) M.A Ameri Fard Nasrand, Y. Li, "Optimizing Re-inspection Time and Repair Policies for Pipe Cracks using Value of Information", *Journal of Pipeline Systems Engineering and Practice*, 2024. (To be submitted)
- 4) M.A Ameri Fard Nasrand, Y. Li, "Risk-based Inspection Scheduling for Imperfect Repair of Pipe Cracks", *Reliability Engineering and System Safety*, 2024. (To be submitted)
- 5) M.A Ameri Fard Nasrand, Y. Li, "Adaptive Maintenance Planning for Imperfect Repair of Pipe Cracks using Reinforcement Learning", *Reliability Engineering and System Safety*, 2024. (Under Preparation)

Conference Papers:

- 1) M.A. Ameri Fard Nasrand, Peng H, Qiu W., Li Y, Adeeb S., "A Predictive Methodology for Estimating Runtime and Computational Resources in Complex Structural Reliability Problems Using Parallelized Monte Carlo Sampling", *CSCE Conference 2025, Winnipeg, Canada*.
- 2) M.A Ameri Fard Nasrand, S. Koduru, Y. Li, "Optimizing Crack Repair Policies using Value of Information Analysis considering Imperfect Inspection", *ICASP14, Dublin, Ireland, 2023*.
hdl.handle.net/2262/103634
- 3) M.A Ameri Fard Nasrand, Y. Li, "Calibrating Crack Depth Threshold for Pipeline Repair Policies", *CSCE Conference 2023*.
doi.org/10.1007/978-3-031-61539-9_18
- 4) S. Koduru, M.A Ameri Fard Nasrand, Y. Li, "Sensitivity of Optimal Decision to Consequence Assumptions in VOI Analysis", *IFIP WG 7.5 Conference, Kyoto, Japan, 2022*.
doi.org/10.14989/ifipwg75-2022.4

REFERENCES

Prof. Yong Li <i>Associate Professor, University of Alberta</i>	yong9@ualberta.ca <i>PhD Supervisor</i>
Prof. Samer Adeeb <i>Professor, University of Alberta</i>	adeeb@ualberta.ca <i>PhD Supervisor Committee</i>
Prof. Mojtaba Mahsuli <i>Associate Professor, Sharif University of Technology</i>	mahsuli@sharif.edu <i>M.Sc. Supervisor</i>