

Mohammadreza Javadzadegan

Civil / Structural Engineering | FEM | Structural Health Monitoring | Machine Learning for Damage Detection
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RESEARCH PROFILE

Civil and structural engineering researcher with a background in earthquake engineering, finite element modelling, structural dynamics, and vibration-based structural health monitoring. My current research focuses on damage location and severity prediction in frame structures using modal features, finite element simulations, and machine-learning models such as ANN, SVM, Random Forest, and LSBoost. I am particularly interested in structural connections, steel and RC frames, numerical-experimental validation, and practical methods for safer and more sustainable infrastructure assessment.

EDUCATION

Master's Degree in Civil Engineering – Earthquake Engineering | Sep 2021 – Sep 2023

Azərbaycan Şahid Mədanı University, Tabriz, Iran

Bachelor's Degree in Civil Engineering | Sep 2011 – Jun 2017

Islamic Azad University of Tabriz, Tabriz, Iran

RESEARCH OUTPUT

Accepted Conference Paper | SMAR 2026

Machine-Learning-Based Damage Detection in Beam-Column Connections Using Modal Features

- Accepted for SMAR 2026 – 8th International Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures; prepared for conference proceedings publication.
- Compared ANN, SVM, Random Forest, and LSBoost for damage prediction using natural frequencies and mode-shape features in benchmark and numerical frame studies.
- Showed that mode-shape information improves damage localization compared with frequency-only predictors.

Manuscript Ready for Submission | Ready to submit

Search-Optimized Support Vector Machines for Vibration-Based Structural Damage Location and Severity Prediction in Experimental and Numerical Frame Benchmarks

- Focuses on optimized SVM-based prediction of damage location and severity using vibration-based features.
- Extends my current research direction toward experimental and numerical frame benchmarks and search-based model optimization.

Master's Thesis | 2023

Damage Identification in Beam-to-Column Connections of Structures Using Artificial Neural Networks (ANN)

- Modelled beam-column connections as semi-rigid elements using finite element concepts in MATLAB.
- Used modal data, including periods and mode shapes, as inputs to artificial neural networks for damage identification.
- Evaluated the ability of ANN models to predict damage in structural connections.

TECHNICAL SKILLS

Structural Engineering	Structural health monitoring, damage detection, modal analysis, structural dynamics, steel structures, beam-column connections, RC/steel frame behaviour
Computational Modelling	Finite element methods, MATLAB modelling, eigenvalue analysis, numerical data generation, model updating concepts, vibration-based assessment
Machine Learning	ANN, SVM, search/optimization-based modelling, Random Forest, LSBoost, regression metrics, training/validation/test workflows
Engineering Tools & Practice	MATLAB, ETABS, technical office work, quantity surveying, site supervision, project coordination, resource optimization

TEACHING AND ACADEMIC SUPPORT

Peer Teaching and Project Support

Academic support during Master's and Bachelor's studies

- Master's level: supported classmates with Finite Element Method projects and modelling concepts.
- Bachelor's level: supported classmates with ETABS, Steel Structures, and Soil Mechanics Laboratory coursework.
- Developed the ability to explain technical concepts clearly and help others complete engineering projects.

English Free Discussion Sessions Instructor | Dec 2019 – Present

Company Plus

- Holding free discussion sessions.

SELECTED ENGINEERING AND PROFESSIONAL EXPERIENCE

Senior Supervisor | Nov 2022 – Present

Payab Tarh

- Coordinated supervision activities for several construction initiatives on a part-time basis.

Supervising Engineer | Jul 2019 – Sep 2019

Payab Tarh

- Oversaw construction work on a 304-bed hospital project in Marand, Iran.

On-site Supervisor | Aug 2016 – Sep 2017

Payab Tarh

- Supervised a unique construction project involving advanced materials and structural systems for the Azerbaijan Museum in Tabriz, Iran.

Technical Office Engineer / On-site Engineer | May 2014 – Aug 2016

Amaaj Beton Paya

- Performed quantity surveying and site engineering work on a 17-storey residential building with approximately 250 units in Tabriz, Iran.

Supervising Engineer | May 2013 – May 2014

Payab Tarh

- Coordinated development of a five-storey hospital and its surrounding area.

Additional Management Experience | Sep 2019 – Present

Company Plus

- Planned and managed events and multilingual programmes, strengthening organization, communication, and coordination skills.

CERTIFICATES AND LANGUAGES

TOEFL iBT: 91- Best score: 95

Languages: English – Advanced/C1; Persian – Proficient/C2; Azerbaijani – Proficient/C2; Turkish – Intermediate/B1.

RESEARCH INTERESTS

Structural health monitoring; vibration-based damage detection; finite element modelling; structural dynamics; steel and RC frame connections; modal testing and model updating; machine learning for infrastructure assessment; sustainable and reusable structural systems.

SELECTED REFERENCES

Dr. S.S. Kourehli – Thesis Advisor | ss.kourehli@azaruniv.ac.ir

Dr. B.A. Dizaj – FEM Course Professor | ebrahim.afzaldizaj@soton.ac.uk

Amir Shamsaddinlou – Research Collaborator, University of Messina | amir.shamsaddinlou@studenti.unime.it