

Hooman Nick

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M.Sc. structural engineer specializing in Structural Health Monitoring (SHM) of bridges and frames. Proficient in finite element (FE) modelling with ABAQUS and in Python/MATLAB machine learning (ML) pipelines using modal data to quantify damage and estimate severity with artificial neural networks (ANNs), robust to measurement noise. Seeking a fully funded PhD position in SHM and AI based structural monitoring starting Fall 2026.

Academic Background

01/2016 – 09/2019	Master of Science (M.Sc.) in Structural Engineering - Islamic Azad University of Science and Research Branch, Tehran, Iran Thesis: “Damage identification in steel girder bridges using modal strain energy-based damage index” Supervisors: Dr. Armin Aziminejad, Dr. Mirhamid Hosseini GPA: 17.20/20
09/2010 – 09/2015	Bachelor of Science (B.Sc.) in Civil Engineering - Islamic Azad University of Parand, Iran GPA: 15.44/20

Research Experience

01/2021 – 12/2023	Senior Researcher - Iran's National Elites Foundation, Tehran <ul style="list-style-type: none">Developed a dual-criteria, two-stage damage identification framework for steel frames, integrating modified Modal Flexibility Damage Index (MFDI) and Modal Strain Energy-based Damage Index (MSEDI) to significantly improve detection reliability.Developed and trained two distinct Artificial Neural Networks, each specialized for an individual damage index, to precisely quantify the severity of both single and multiple damage scenarios.Introduced a computationally efficient data-gathering strategy for ANN training by collecting data exclusively from the detected damage location and its immediate neighbors, reducing computational costs.Published the methodology and results in <i>Structures</i> (2023).
01/2016 – 09/2019	Research Assistant (M.Sc.) - Islamic Azad University of Science and Research Branch <ul style="list-style-type: none">Developed a method for steel girder bridges that couples a modal strain-energy-based (for localization) with an ANN (for severity quantification).Advanced the methodology to address real-world limitations by investigating its performance under noisy conditions, identifying Modal Flexibility (MFDI) as the most robust damage indicator.Engineered a novel noise-cancellation and quantification approach by training an ANN to map noisy vibration data to a noise-free output, successfully estimating damage magnitude in contaminated datasets.Constructed and validated a 3D Finite Element (FE) model of the I-40 Bridge in ABAQUS, which served as the analytical testbed for developing and testing all damage detection frameworks.Published the primary findings in two peer-reviewed journals: <i>Engineering Failure Analysis</i> and the <i>Journal of Nondestructive Evaluation</i>.

Publications

Academic Impact Metrics: Total Citations: 189 | h-index: 3 (Source: [Google Scholar](#), as of November 2025)

Peer-Reviewed Journal Articles

- **Nick, H.**, Ashrafpoor, A., & Aziminejad, A. (2023). Damage identification in steel frames using dual-criteria vibration-based damage detection method and artificial neural network. *Structures*, 51, 1833-1851. <https://doi.org/10.1016/j.istruc.2023.03.152>
- **Nick, H.**, & Aziminejad, A. (2021). Vibration-based damage identification in steel girder bridges using artificial neural network under noisy conditions. *Journal of Nondestructive Evaluation*, 40(2). <https://doi.org/10.1007/s10921-020-00744-8>
- **Nick, H.**, Aziminejad, A., Hosseini, M. H., & Laknejadi, K. (2021). Damage identification in steel girder bridges using modal strain energy-based damage index method and artificial neural network. *Engineering Failure Analysis*, 119. <https://doi.org/10.1016/j.engfailanal.2020.105010>

Conference Presentations

- **Nick, H.** (2020). Damage Identification in steel girder bridges via modal flexibility damage index and artificial neural network under the influence of noise. *4th International Conference on Civil, Structural and Earthquake Engineering, Tehran, Iran*.
- **Nick, H.**, Aziminejad, A., Hosseini, M. H., & Laknejadi, K. (2019). Damage assessment of steel girder bridges using modal strain energy and artificial neural network. *3rd International Conference on Applied Researches in Structural, Tehran, Iran*.
- **Nick, H.**, Aziminejad, A., Hosseini, M. H., & Laknejadi, K. (2019). Damage identification in steel girder bridges using improved damage index method by modal combination and artificial neural network. *8th International Conference on Seismology & Earthquake Engineering, Tehran, Iran*.
- **Nick, H.**, Aziminejad, A., Hosseini, M. H., & Laknejadi, K. (2019). Damage identification in girders of steel bridges using damage index method and artificial neural network. *5th International Conference on Bridge, Tehran, Iran*.

Professional Experience

01/2018 – Present	Bridge Designer - ASAN TARH PARS Engineering Consultant Co., Tehran	<ul style="list-style-type: none">• Designed urban/rural steel-girder bridges with earthquake-resistant details and code compliance.• Built and validated analysis models with SAP2000, ETABS, SAFE, CSiBridge.
01/2017 – 12/2018	Bridge & Structural Designer - KIATARH Engineering Consultant Co., Tehran	<ul style="list-style-type: none">• Contributed to superstructure/substructure designs and performed seismic checks for buildings.
01/2016 – 12/2017	Intern (Structural & Bridge Design) - PASAR Engineering Consultant Co., Tehran	<ul style="list-style-type: none">• Supported project execution via AutoCAD drafting, 3D modeling, preliminary concepts, and material/cost studies.

Academic Service & Peer Review

08/2025	Peer Reviewer, <i>Scientific Reports</i> (Springer Nature); reviewed one manuscript.
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Technical Skills & Languages

- **Finite-Element & Structural Analysis:** ABAQUS; SAP2000; ETABS; SAFE; CSiBridge; AutoCAD
- **Programming & Data Analysis:** Python (data processing, plotting); MATLAB (time-series analysis, artificial-neural-network training); C (basic)
- **Structural Health Monitoring Methods:** Vibration-Based Damage Detection (Modal Strain Energy damage index & Modal Flexibility damage index), Finite-Element Modeling (FEM), Model Updating, Time Series Preprocessing, Anomaly Detection
- **Research Interests:** BIM-SHM Integration, Digital Twin Methodologies, Real-Time monitoring and decision support
- **Languages:** English - TOEFL iBT 100 (R25 | L27 | S23 | W25; Oct 19, 2024); Persian - Native

Honors & Awards

2017	Ranked top 1% among M.Sc. structural engineering cohort (IAU - Science & Research Branch)
2017	1st place, Matrix Analysis project (IAU - Science & Research Branch)
2016	Ranked top 1% in national graduate entrance exam (~570,000 participants)
2015	1st place, Steel Structures project (Azad University of Parand)

References

Dr. Armin Aziminejad - Assistant Professor, Civil Engineering, Islamic Azad University (Science & Research Branch), Tehran

Email: arminaziminejad@srbiau.ac.ir | Relationship: M.Sc. thesis supervisor

Dr. Karim Laknejadi - Assistant Professor, Civil Engineering, Islamic Azad University (Science & Research Branch), Tehran

Email: k.laknejadi@srbiau.ac.ir | Relationship: M.Sc. thesis advisor and instructor