Amin Tanhadoust

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Structural engineering PhD candidate at Isfahan University of Technology with a demonstrated history of research. Skilled in mathematical and numerical simulation, computational engineering, optimization, Artificial Intelligence and Machine Learning, FEM analysis, NANO-mechanics and material sciences. Strong research professional with a Master's degree focused on computational NANO-mechanics from Sharif University of Technology. Also, interested in photography, physics, computer sciences and complexity.

Research Interests

- Artificial Intelligence and Machine Learning
- Digital Twin and Mathematical Modeling
- Evolutionary Computation and Optimization, MDO, MOO
- Discrete and Combinatorial Optimization
- Complexity Theory
- Genetic Algorithm

- Computational Mechanics (NANO, Plasticity, FEM, X-FEM, FDM, Fracture, Contact and Friction Modeling, Large Deformation Analysis), CFD and Heat Transfer Problems
- Computational Material Science and High Tech Materials
- Composite Materials and Meta-Materials
- Multidisciplinary and Multi-scale Modeling

Education

Isfahan University of Technology | Isfahan, Iran   **2016 - Present**
PhD. in Structural Engineering
Supervisor: Dr. M. Madhkhan, Advisor: Dr. M. Daei
Current Project: "A Two-Stage Multi-Objective Design Optimization of Reinforced Concrete Structures Base on Nonlinear Analysis"

Sharif University of Technology | Tehran, Iran   **2013 – 2016**
M.Sc. in Structural Engineering (In English)
Supervisor: Dr. A. R. Khoei, Co- Supervisor: Dr. M. Jahanshahi
Thesis: "Temperature-Dependent Multi-scale Simulation of Single Layer Graphene Sheet in Large Deformations"

Isfahan University of Technology | Isfahan, Iran   **2008 - 2013**
B.A.Sc. in Structural Engineering
Supervisor: Dr. M.R. Eftekhar
Project: "Corrosion of Steel in Reinforced Concrete Structures"

National Organization for Development of Exceptional Talents | Arak, Iran   **2001 - 2008**
Diploma in Mathematics and Physics (Middle and High School)
Allame Helli Education Center

Skills

- Problem Solving, Teamwork, Teaching and Presenting
- AI, Machine Learning and Deep Learning
- Discrete and Combinatorial Optimization
- Evolutionary Optimization, MDO, MOO, GA, ACO
- Topology, Shape and Structural Optimization
- Data Collection and Analysis
- Post-processing and Pre-processing of data

- Finite Element Analysis, Nonlinear and X-FEM, Matrix Analysis of Structures
- Composite Structures and Materials
- Computational Mechanics and NANO-mechanics
- Multi-disciplinary studies
- Multi-Scale Modeling
- Molecular Dynamics and Statics

Software and Programming Languages

- MATLAB (EXPERT, since 2008)
- Python (Skilled), Fortran (Beginner)
- AI, ML and DL with MATLAB and Python (Tensorflow, Keras)
- LAMMPS, ABAQUS, OpenSEES, ETABS, SAFE
- Windows OS, Autodesk AutoCad, LATEX, Office Suites
- Tecplot, OriginPro, Adobe Photoshop, CorelDraw

Engineering

- Reinforced Concrete and Steel Structures
- Seismic Design, Earthquake Engineering and Dynamics
- Designing, Building and Operating Equipment
- Structural Design Optimization

Industrial Skills

- Industrial Structures and Foundation (Design and Construction)
- Agricultural Structures (Design and Construction)
- Pressure Vessel Design
- Storage Tank, Vessel and Industrial Foundations (Design and Construction)

Experiences

Bauhaus-Universität Weimar | Weimar, Germany   **Apr 2017**
GRK International Workshop 2017
"Coupled Numerical and Experimental Models in Structural Engineering"

Bauhaus-Universität Weimar | Weimar, Germany   **Apr - May 2015**
Model Validation and Simulation / Forecast Engineering
Project: "Topology Optimization and Shape Optimization"

Sharif University of Technology | Tehran, Iran   **2013 - 2015**
Graduate Teaching Assistant
Courses: "Finite Element Method I" and "Finite Element Method II"

Isfahan University of Technology | Isfahan, Iran   **Apr - May 2012**
Member of Executive Committee
9ICEE (9th International Civil Engineering Exhibition)

Iranian Society of Surface Science & Technology | Isfahan, Iran   **Aug - Sep 2010**
Member of Executive Committee
11th National Seminar on Surface Engineering, Olympic Hotel, Tehran, Iran

Publications

"Life cycle assessment multi-objective optimization and deep belief network model for sustainable lightweight aggregate concrete", Journal of Cleaner Production, Link   **2021**

"Temperature-Dependent Multi-Objective Optimization of Mechanical Properties of Lightweight Concrete Using DBN", Structural Concrete, Under Review

"High-Temperature Behavior of Lightweight-Aggregate RC Beams ", ACI Materials Journal, Submitted

"A Framework for Multi-Objective Design Optimization of Reinforced Concrete Sections Based on Nonlinear Analysis: Beam Section Database", Engineering Optimization, Under Review

"Prediction of Stress-Strain Curve Using Long Short-Term Memory (LSTM) for Lightweight Concrete Exposed to High Temperature", Prepared for Submission

"A Framework for Multi-Objective Design Optimization of Reinforced Concrete Sections Based on Nonlinear Analysis: Column Section Database", In Preparation for Submission

"A Framework for Multi-Objective Design Optimization of Reinforced Concrete Sections Based on Nonlinear Analysis: Shear Wall Database", In Preparation for Submission

"Economical Investigation of Using Stainless Steel Clad Rebar In RC Structures for Preventing Corrosion"   **2013**
Iranian Society of Surface Science and Technology, Isfahan, Iran

Work Experiences

R. Pardis Agriculture and Dairy Co. | Arak, Iran   **2012 - Present**
Development Manager

Kimya Sanat Ferdos Chemicals | Arak, Iran   **2019 - Present**
Structure Designer

References

Dr. Moncef Nehdi (Professor)
Department of Civil and Environmental Engineering, Western University (The University of Western Ontario), Ontario, Canada
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mnehdi@eng.uwo.ca

Dr. Amir R. Khoei (Professor)
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