Curriculum Vitae

Mohammad Iman Khodakarami

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RESEARCH INTERESTS

1) Computational Mechanics,
2) Nonlinear Dynamic Problems,
3) Wave Propagation,
4) Inverse Problem,
5) Metamaterials,

PROFESSIONAL APPOINTMENTS

- **Head of Earthquake and Structural Engineering Faculty of Civil Engineering, Semnan University**; Feb. 2013 – Current
- **Assistant Professor at Computational Earthquake/Geo-technical Earthquake Engineering;** Semnan University, Semnan, Iran, Jan. 2012 – Present
- **Research Assistant;** Tarbiat Modares University, Tehran, Iran, Sep. 2008 – Sep. 2012.
- **Research Fellowship at Earthquake research institute (ERI);** The University of Tokyo, Tokyo, Japan, 2010 – 2011

Program Area:

- Computational Mechanics.

EDUCATION

- Ph.D. Sabbatical leave; Earthquake Research Institute (ERI), University of Tokyo, Tokyo, Japan, 2011. Supervisor: Prof. Muneo Hori.

- Ph.D. Computational Mechanics (Civil Engineering), Tarbiat Modares University, Tehran, Iran, Sep. 2008- Jan. 2012 (Grade A+, Rank of graduation = First, worth thesis prize);

Thesis: A scaled Boundary-Finite element method with diagonal coefficient matrices for solving elastodynamics problems.

- M.Sc. Earthquake Engineering, Khaje Nasir Toosi University of Technology (K.N.Toosi U.T.), Tehran, Iran, Sep. 2006- Sep. 2008 (Grade = A, Rank of graduation = First);

Dissertation: Assessment of seismic behavior of masonry building using 3-D time-history analysis.

- B.Sc. Civil Engineering, Semnan University, Semnan, Iran, Feb. 2002-Mar. 2006 (Grade A, Rank of graduation =honor, First).

PATENTS

- Iran Patent, Title*: " Building doors with capabilities to secure prism against debris"*, 2016, Tehran, Iran

- Iran Patent, Title: *"A device for geometric feature detection of rebar in the reinforced concrete",* 2015, Tehran, Iran.

- Iran Patent, Title: *"Inverse Structural Airfoil* ", 2014, Tehran, Iran.

AWARDS

- Best Ph.D. Thesis; Tarbiat Modares University, Tehran, Iran, Dec. 2012.
- Honored Student, Tarbiat Modares University, Awarded in 2009.
- Honored Student, Khaje Nasir Toosi University of Technology (KN-Tossi U.T.), Awarded in 2008.
- Honored Student, Semnan University, Awarded in 2006.

RESEARCH PROJECTS

Development of fragility curves for buried pipelines regarding pipe-soil-interaction effects due to seismic wave propagation, Tehran, Iran, 2016-2017.

PROFESSIONAL MEMBERSHIP

- Referee in Modares Civil Engineering Journal
- Referee in Journal of rehabilitation in civil engineering
- Referee in Journal of modeling in engineering.
- Referee for innovations in National Elite Foundation of Iran.
- Executive Secretary of the 2nd National Conference of Concrete Industry, Iran, Feb. 2014.
- Iranian Earthquake Engineering Association.
- Iranian Construction Engineering Organization.

TEACHING EXPERIENCE

Graduate Courses:

- Finite Element Method (FEM, SBFEM)
- Elastodynamics; Wave Propagation
- Advanced Engineering Mathematics
- Advances in Modeling Engineering problems
- Soil-Structure-Interaction

Undergraduate Courses:

- Programming; C++ & ForTran
- Fundamentals of Earthquake Engineering
- Basics of Modeling in Engineering
- Strength of Materials
- Analysis of Structures
- Vector Mechanics; Dynamics

PUBLICATIONS

Journal Papers:

- Maleki M, **Khodakarami MI**. Feasibility analysis of using MetaSoil scatterers on the attenuation of seismic amplification in a site with triangular hill due to SV-waves. *Soil Dynamics and Earthquake Engineering*, *100*(2017): 169-182.

- Nikpoo B, **Khodakarami MI.** *Quantitative solution of 2-D inverse elastodynamics problems using hybrid FDM-FEM and PSO (In Persian).* Modares Civil Engineering Journal, Accepted 2017.

- Farajian M, **Khodakarami MI**, Kontoni DPN. 2017. Evaluation of Soil-Structure Interaction on the Seismic Response of Liquid Storage Tanks under Earthquake Ground Motions. *Computation*, *5*(1), p.17.

- **Khodakarami MI**, Khakpour-Moghaddam H. "Evaluating the Performance of Rehabilitated Roadway Base with Geogrid Reinforcement in the Presence of Soil-Geogrid-Interaction." *Journal of Rehabilitation in Civil Engineering* 5, no. 1 (2017): 33-46.

- Rahimi V, **Khodakarami MI**. *Identification of multi apex event tree as a new aproach of event tree method for reliability analysis on reinforced masonry building against earthquake hazard with shaking table test*. Journal of Seismology and Earthquake Engineering, Accepted for publishing in 2017.

- **Khodakarami MI**, Maleki M, Mounesi-Sorkheh. *Inverse structural airfoil: a novel and effective tools for improvement of the buildings performance against wind loads*. Asian journal of civil engineering (BHRC), 2017, 18(3).

- Yazdani M, Khaji N., **Khodakarami MI**. *Development of a new semi-analytical method in fracture mechanics problems based on the energy release rate*. Acta Mechanica, 2016, doi:10.1007/s00707-016-1685-3.

- Mirzajani M, Khaji N, **Khodakarami MI**. *A new global nonreflecting boundary condition with diagonal coefficient matrices for analysis of unbounded media.* Applied Mathematical Modelling, 2016, 40(4): 2845–2874.

- Vahdani R, Bitarafan M, **Khodakarami MI**. *Effect of the soil-structure interaction on*

performance assessment of the energy-based cumulative damage index in concrete reinforced frames (In Persian). Journal of Structural and Construction Engineering, 2016, 2(3): 16-29.

- **Khodakarami MI**, Fakharian M. *A new modification in decoupled scaled boundary method with diagonal coefficient matrices for analysis of 2d elastostatic and transient elastodynamic problems.* Asian journal of civil engineering (BHRC), 2015; 16(5): 709-732.

- **Khodakarami MI**, Noori Y. *Analytical investigation of the Effects of topographic irregularities on Peak Loads to Buildings due to High Frequency Waves (In Persian).* Journal of Structure and Construction Engineering, 2015, 2(1): 56-67.

- **Khodakarami MI**, Khaji N. *Wave propagation in semi-infinite media with topographical irregularities using Decoupled Equations Method. Soil Dynamics and Earthquake Engineering*, 2014; 65: 102-112.

- **Khodakarami MI**, Noori Y. *Evaluation of the maximum load on structures located in a topographic irregularities due to high-frequency waves.* Journal of Transportation Infrastructure Engineering, 2013(1): 33-44.

- Khaji N, **Khodakarami MI**. *Decoupled Equations Method: a new semi-analytical method with a system of decoupled partial differential equations for three-dimensional elastostatic problems.* International Journal of Solids and Structures; 2012: 2528-2546.

- **Khodakarami MI**, Khaji N, Ahmadi MT. *Modeling transient elastodynamic problems using a novel semi-analytical method yielding decoupled partial differential equations*. Comput. Methods Appl. Mech. Engrg. 213-216 (2012) 183-195.

- **Khodakarami MI**, Khaji N. *Analysis of elastostatic problems using a semi-analytical method with diagonal coefficient matrices.* Engineering Analysis with Boundary Elements, 2011; 35: 1288-1296.

- Khaji N, **Khodakarami MI**. *A new semi-analytical method with diagonal coefficient matrices for potential problems.* Engineering Analysis with Boundary Elements, 2011; 35: 845-854.

Conference Papers:

- Khodakarami MI, Khalaj-Hedayati HR. *Decupled SBFEM as a macro element for FE analysis*. WCCM XII-APCOM VI, July 24-29, 2016, Seoul, South Korea.

- Farajian M, Khodakarami MI, Kontoni D-P.N. *Investigation of 2d seismic behavior of underground rectangular concrete tanks affected by in-plane seismic vibrations*

incorporating soil–structure–fluid interaction. 7th IC-SCCE, 6-9 July, 2016, Athens, Greece.

> Tajik M, Khodakarami MI, Kontoni D-P.N. *Evaluation of soil-structure interaction on the seismic response of liquid storage tanks under near-field ground motions*. 7th IC-SCCE, 6-9 July, 2016, Athens, Greece.

> Brahman M, Khodakarami. *A new technique in order to attention of seismic amplification due to topographical irregularities*. 9NCCE, May 10-11, 2016, Mashhad, Iran.

> Nikppo B, Khodakarami MI. *Quantitative solution of 2-D inverse elastodynamics problems using FEM method and PSO*. 9NCCE, May 10-11, 2016, Mashhad, Iran.

> Khakpoor Moghaddam H, Khodakarami MI, Kontoni D-P.N. *Assessment of the under-ground water level effects on the nonlinear behavior of single pile subjected to static vertical loads in the presence of soil-pile interaction*. 8th GRACM International Congress on Computational Mechanics, July 12 - 15, 2015, Volos, Greece.

> Kontoni D-P.N, Khodakarami MI. *A modified decoupled scaled Boundary-Finite Element Method for Modeling 2D in-plane-motion transient elastodynamic problems in semi-infinite media.* 8 GRACM International Congress on Computational Mechanics, July 12 - 15, 2015, Volos, Greece.

> Bahrami M, Khodakarami MI, Kontoni D-P.N. *Analysis of the dynamic soil-pile interaction during the passage of rayleigh waves using fourier transform.* 6th International Conference on Experiments/Process/System Modelling/Simulation/Optimization" (6th IC-EpsMsO), July 8-11, 2015, Athens, Greece.

> Hashemi SM, Khodakarami MI, Kontoni D-P.N. *Qualitative inverse scattering elastostatics problems in layered domain using Linear Sampling Method.* 6th International Conference on Experiments/Process/System Modelling/Simulation/Optimization" (6th IC-EpsMsO), July 8-11, 2015, Athens, Greece.

^ Mahdavi Z, Khodakarami MI, Kontoni D-P.N. *Qualitative flaw detection in piezoelectric material for elastostatics using Linear Sampling Method.* 6th International Conference on Experiments/Process/System Modelling/Simulation/Optimization" (6th IC-EpsMsO), July 8-11, 2015, Athens, Greece.

> Khodakarami MI, Fkharian M. *Analysis of two-dimenstional Elastodynamics problems using the Novel scaled boundary based Decoupled equations method.* 7th International Conference on Seismology & Earthquake Engineering (SEE7), May 18-21, 2015, Tehran, Iran.

> Rahimi V, Khodakarami MI. *Reliability Analysis on Reinforced Masonry building against earthquake hazard with shaking table tests.* 7th International Conference on Seismology & Earthquake Engineering (SEE7), May 18-21, 2015, Tehran, Iran.

> Hadad AH, Khodakarami MI, Hemmati S. *Numerical evaluation of wall rigidity effects on the applied dynamic earth pressure.* 10th International Congress on Civil Engineering (10ICCE), May 5-7, 2015, Tabriz, Iran.

> Fakharian M, Khodakarami MI. *A modified decoupled semi-analytical approach based on SBFEM for solving 2D elastodynamic problems.* XIII International Conference on Theoretical and Computational Mechanics (ICTCM 2015); Istanbul, Turkey *(Full-text is accepted).*

> Mirzajani M., Khaji M., Khodakarami MI. *Suggestion a diagonal dynamic matrix for analyze a semi-infinite medium in frequency domain* .7th National Congress on Civil Engineering (7NCCE 2013); Zahedan, Iran, (In Persian).

> Khodakarami MI, Khaji N. *A novel three-dimensional semi-analytical method with diagonal coefficient matrices for potential problems.* 9th International Congress on Civil Engineering (9 ICCE), 8-10 May 2012, Isfahan, Iran.

> Khodakarami MI, Khaji N. *A novel semi-analytical method with diagonal coefficient matrices for the analysis of elastostatic problems.* 12th International Conference on Boundary Element and Meshless Techniques (BeTeq 2011); Brasilia, Brazil.

> Khodakarami MI, Khaji N. *Analysis of potential problems using a new semi-analytical method including decoupled governing equations.* International conference on Simulation Technology (SimTech 2011); Stuttgart, Germnay.

> Khodakarami MI, Khaji N. *Application of higher-order elements in scaled boundary finite element method (SBFEM) to improve its accuracy and* efficiency. 5th National Congress on Civil Engineering (5NCCE 2010); Mashhad, Iran.

> Khaji N, Khodakarami MI. *Site response analysis of wave propagation in half-space with topography irregularities based on a novel simulation technique.* 15th World Conference on Earthquake Engineering (15 WCEE), 14-28 Sep. 2012, Lisbon, Portugal.

STUDENT'S THESIS

Past as supervisor

♦♦♦ **Mohammad Bahrami (2016);** *"A study on mutual effects of fracture wedge and soil settlement on dynamic behavior on anchored diaphragm walls",* Semnan University, Semnan, Iran (Secondary Supervisor).

♦♦♦ **Mohsen maleki (2016);** *"Reduction of the amplification of ground motion due to topographic irregularities using smart materials",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Masoud Mounesi Sorkheh (2016);** *" Evaluation of seismic behavior of buried tunnels in the presence of nonlinear soil-structure-interaction",* Semnan University, Semnan, Iran, (Primary Supervisor).

♦♦♦ **Amin Asghari (2016);** *"Determining the dynamic characteristics of stabilized soil using tri-axial cyclic test",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Mehdi Tajik (2016);** *"Evaluating seismic behavior of liquid reservoir using 3D full model in the presence of soil-structure-fluid -interaction",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Mehdi Malek** (2016); *"Assessment of seismic behavior of vertical topography under excitations due to earthquakes- case study: Zibashahr Hill, Gorgan, Iran",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Bahador Nikpoo (2016);** *" Quantitative approach for solving elastodynamic inverse problems using coupled FE/DE method and particle swarm optimization algorithm",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Zeinab Mahdavi (2016);** *"Application of the linear sampling method for solving inverse problems in heterogeneous domains",* Semnan Universit, Semnan, Iran (Primary Supervisor).

♦♦♦ **Saeideh Safarpour (2015);** *"Evaluating Dynamic behavior of buried pipes under surface waves",* ASIHE University, Semnan, Iran (Primary Supervisour).

♦♦♦ **Mahshid Brahman (2015);** *"Proposing a novel technique for reduction of amplification of seismic waves near topographic irregularities",* Semnan University, Semnan Iran (Primary Supervisor).

♦♦♦ **Majid Fakharian (2015);** ***"****Analysis of high-frequency elastodynamic problems using a semi-analytical approach based on scaled boundaries",* Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Vahid Rahimi (2015);** *"A study on feasibility of HAZUZ methodology for risk assessment of structures in Iran",* Semnan University, Semnan, Iran (Secondary Suprvisor).

♦♦♦ **Seyed Mostafa Hashemi (2017);** *"Developing the method of linear sampling for solving inverse problems in heterogeneous domains",* Semnan Universit, Semnan, Iran (Primary Supervisor).

♦♦♦ **Saeideh Amini-Moghaddam (2017);** *"Evaluation of optimum separation gap between two steel structures due to Structures-Soil-Structure-Interaction effects using PSO"***,**

Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Maryam Aris-Lekvan (2017);** *"Reliability analysis of separation gap between two adjacent structures in building codes due to Structures-Soil-Structure-Interaction effects"***,** Semnan University, Semnan, Iran (Primary Supervisor).

Current as supervisor

♦♦♦ **Mostafa Farajian (Expected Date for finish, Oct. 2017);** *"Developing of the periodical metamaterials for reduction of seismic vibrations*, Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Mahsa Shamsaei (Expected Date for finish, Oct. 2017);** *" Development of fragility curves for buried pipelines regarding pipe-soil-interaction effects due to seismic wave propagation*, Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Arash Ma'roufi (Expected Date for finish, Oct. 2017);** *"Assessment of seismic behavior of structures near buried pipelines"*, Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Mohammad Hossein Asgari (Expected Date for finish, Oct. 2017);** *"A study on seismic behavior of liquid storage tanks located on topographic irregularities"*, Semnan University, Semnan, Iran (Primary Supervisor).

♦♦♦ **Arezoo Sabzali (Expected Date for finish, Oct. 2017);** *"Reduction of detrimental effects of dynamic soil-structure-interaction using Neuro-Fuzzy algorithm"*, Semnan University, Semnan, Iran (Primary Supervisor).

Past as advisor

♦♦♦ **Mohammad Ali Mansouriyan (2016); "***Performance Based Design of foundation by controlling sttelment and rocking"*, SEmnan University, Semnan, Iran.

♦♦♦ **Mehdi Yazdani (2016);** *"Developing Decoupled scaled boundary-finite element method for solving fracture mechanics problems",* Tarbiat Modares University, Tehran, Iran.

♦♦♦ **Hamed Khakpour-Moghaddam (2016);** *"Numerical study on effects of retrofitted unpaved road using geogrid"*, Semnan University, Semnan, Iran.

♦♦♦ **Somayyeh Hemmati (2015);** *"Numerical analysis of the effect of vertical loads at the surface on soil dynamic lateral pressure on the walls of concrete block weighing*

Hunchback", Semnan University, Semnan, Iran.

♦♦♦ **Majid Bitarafan (2015);** *"Assessment of Soil-Structure-Interaction on damage indexes of 2D structure frames",* Semnan University, Semnan, Iran.

♦♦♦ **Amin Ghazanfari-Tehran (2014);** *"Dynamic analysis of fluid- soil-dam interaction using Decoupled scaled boundary-finite element method",* Tarbiat Modares University, Tehran, Iran.

♦♦♦ **Mohsen Mirzajani (2013);** *" Application of novel decoupled scaled boundary-finite element method for evaluating for proposing a new global nonreflecting boundary condition",* Tarbiat Modares University, Tehran, Iran.