



Razieh Izadi

EDUCATION AND TRAINING

PhD

Shiraz University [22/09/2013 – 15/02/2019]

Address: Shiraz (Iran)

Field(s) of study: Mechanical Engineering, Solid Mechanics

Final grade: 18.3/20

Thesis: Mechanical Modeling and Analysis of Fullerene Molecules and Fullerene Reinforced Composites (Thesis Grade: 19.7/20) - Under Supervisions of: Professor Ali Nayebi and Professor Esmaeel Ghavanloo

- The elastic properties of fullerene reinforced polymer nanocomposite are determined via molecular dynamics simulation
- The interphase and interface regions are distinguished around fullerene molecules and a novel method is proposed to calculate the elastic modulus of the interface as well as interphase region
- A micromechanics model is developed for a non-dilute composite with multi-layer inclusions based on generalised Eshelby results with the assumptions of Mori and Tanaka approach.
- structural instability of fullerene family under tension force is studied
- effective Young's modulus values of fullerene molecules are investigated with a combined molecular dynamics simulation and continuum shell model

Master of Science

Shiraz University [22/09/2011 – 21/09/2013]

Address: Shiraz (Iran)

Field(s) of study: Mechanical Engineering, Applied Design

Final grade: 17.96/20

Thesis: Identification of Material Parameters of Three Dimensional Orthotropic and Monoclinic Materials (Thesis Grade: 19.7/20) Under Supervision of: Professor Mohammad Rahim Hematiyan

In MSc thesis, an inverse method is developed for determination of elastic constants of three-dimensional orthotropic, monoclinic and anisotropic materials. The strain measurements at some sampling points obtained from several elastostatic experiments are considered as the elastic response of the material. The finite element method is used for sensitivity analysis.

Bachelor of Science

Shiraz University [22/09/2007 – 21/09/2011]

Address: Shiraz (Iran)

Final grade: 17.11/20

Thesis: Optimisation of Several Mechanical Problems by means of Programming in ANSYS APDL (Thesis Grade: 19.75/20) - Under Supervision of: Dr. Mohammad Rahim Hematiyan

WORK EXPERIENCE

Assistant professor (RTDA)

Sapienza University of Rome [22/12/2021 – Current]

City: Rome

Country: Italy



fixed-term employment relationship of type "A", with a fixed-time commitment regime, for carrying out research, teaching, supplementary teaching, and student service activities for the execution of the research program relating to the following project: Development of multiscale strategies for simulation and modeling of thermomechanical properties of "Green" nano composites ('molecular dynamics' simulations and non-local multi-field continuous models) with Prof. Patrizia Trovalusci as scientific responsible

•Invited Course **"Introduction to Nano-mechanics: Continuum Modeling and Atomistic Simulation"**, with Dr. Meral Tuna
PhD Course in Structural and Geotechnical Engineering,
PhD Coordinator: Prof. P. Trovalusci
Sapienza University of Rome
Dates: **November 9, 10 and 11- 10:00 to 13:00 (9 hours)**

•Course **"Atelier of Structural Masonry"**, 2 CFU, 50 hours,
Master Degree in Architecture Restoration, Year V, Sem. II, AY 2022/2023
School of Architecture
Sapienza University of Rome

• Lecture on **"Nanotechnology and Conservation/Restoration of Cultural Heritage"**, 2 hours,
Master Degree in Architecture Restoration, Year V, Sem. I, AY 2022/2023
School of Architecture
Sapienza University of Rome

Research Fellow

Sapienza University of Rome [29/11/2020 – 21/12/2021]

City: Rome

Country: Italy

Holder of a research grant titled "Scale-dependent modelling of carbon nanotube reinforced polymer composites as micropolar continua" under the supervision of Professor Patrizia Trovalusci with financial support of Italian Ministry of Education, University and Research, PRIN 2017 protocol n. 2017HFPKZY "Modeling of constitutive laws for traditional and innovative building materials" CUP: B88D19001130001 owned by Prof. Patrizia Trovalusci

Senior mechanical engineer in R&D Department

Nirou Trans Company [22/09/2014 – 31/08/2022]

City: Shiraz

Country: Iran

- Head of project team in R&D Department, Nirou Trans Company (NTC), 2016 to 2022
-Conducting several industrial projects as the head of the team. The team members are skillful electrical and mechanical engineers.
- Presenting a course on "Mechanical Analysis (Static, Dynamic, and Siesmic) of Instrument Transformers and Bushings according to IEC standards" to R&D experts
- International Electronic Committee (IEC) expert, 2021 to present
-Composing an annex for seismic qualification in IEC 61869-1, Contribution in edition of mechanical aspects of IEC standards (IEC 61869-1, IEC/IEEE 63253-5713-8)
- Supervisor of R&D Mechanical Laboratory, NTC, 2015 to 2022
-All the mechanical type tests on newly-designed products are performed in R&D Lab. The Lab. is internationally accredited (possessing ISO17025). The equipment required for the tests are mainly designed by R&D experts.
- R&D mechanical expert, NTC, 2014 to 2022
*-mechanical analyst (mainly in ANSYS)
-Performing mechanical design*



-The interviewer for new mechanical experts

Adjunct lecturer

Islamic Azad University [21/09/2012 – 18/02/2014]

City: Shiraz

Country: Iran

- Course: Mechanics of Materials, Statics, Dynamics
Shiraz, Iran, 2013-2014
- Heat Transfer I, Fundamentals of Thermodynamics, Thermodynamics Lab.
Shiraz, Iran, 2012-2013

PUBLICATIONS

[Thermomechanical characteristics of green nanofibers made from polylactic acid: An insight into tensile behavior via molecular dynamics simulation](#)

[2023]

Izadi, R., Tuna, M., Trovalusci, P., & Fantuzzi N. (2023). Thermomechanical characteristics of green nanofibers made from polylactic acid: An insight into tensile behavior via molecular dynamics simulation, *Mechanics of Materials*,104640.

[A Study on the Effect of Doping Metallic Nanoparticles on Fracture Properties of Polylactic Acid Nanofibres via Molecular Dynamics Simulation](#)

[2023]

Izadi, R., Trovalusci, P., & Fantuzzi, N. (2023). A Study on the Effect of Doping Metallic Nanoparticles on Fracture Properties of Polylactic Acid Nanofibres via Molecular Dynamics Simulation. *Nanomaterials*, 13(6), 989.

[Bending Characteristics of Carbon Nanotubes: Micropolar Elasticity Models and Molecular Dynamics Simulations](#)

[2021]

Izadi, R., Tuna, M., Trovalusci, P., & Fantuzzi, N. (2021). Bending characteristics of carbon nanotubes: Micropolar elasticity models and molecular dynamics simulations. *Mechanics of Advanced Materials and Structures*, 1-18.

[Combined molecular dynamics–micromechanics method to predict elastic properties of fullerene-reinforced polymer composites](#)

[2021]

Izadi, R., Nayebi, A., Ghavanloo, E., 2021. Combined molecular dynamics–micromechanics method to predict elastic properties of fullerene-reinforced polymer composites, *The European Physical Journal Plus*, 136(8), 1-15.

[Torsional characteristics of carbon nanotubes: Micropolar elasticity models and molecular dynamics simulation.](#)

[2021]

Izadi, R., Tuna, M., Trovalusci, P., & Ghavanloo, E. , 2021. **Torsional characteristics of carbon nanotubes: Micropolar elasticity models and molecular dynamics simulation.** *Nanomaterials*, 11(2), 453.

[Elastic properties of polymer composites reinforced with C60 fullerene and carbon onion: Molecular dynamics simulation.](#)

[2019]

Izadi, R., Ghavanloo, E., Nayebi, A., 2019. Elastic properties of polymer composites reinforced with C60 fullerene and carbon onion: Molecular dynamics simulation. *Physica B: Condensed Matter* , 574, 311636.



Computational modeling of the effective Young's modulus values of fullerene molecules: a combined molecular dynamics simulation and continuum shell model.

[2018]

Ghavanloo, E., **Izadi, R.**, Nayebi, A., 2018. Computational modeling of the effective Young's modulus values of fullerene molecules: a combined molecular dynamics simulation and continuum shell model. Journal of molecular modeling 24, 71

Molecular dynamics simulations of structural instability of fullerene family under tension force.

[2018]

Izadi, R., Nayebi, A., Ghavanloo, E., 2018. Molecular dynamics simulations of structural instability of fullerene family under tension force. Molecular Simulation 44, 1338-1343.

An inverse method for determination of elastic constants of three-dimensional orthotropic, monoclinic and anisotropic materials

[2015]

Izadi, R., Hematiyan, M. R., 2015. An inverse method for determination of elastic constants of three-dimensional orthotropic, monoclinic and anisotropic materials, Modares Mechanical Engineering 15, 367-376. (Published in Persian)

CONFERENCES AND SEMINARS

Applicability of Micropolar Theory to Describe the Size Dependency in Torsional and Bending Deformations of Carbon Nanotubes

[Germany, Berlin, 29/03/2023 – 31/03/2023]

Advanced Seminar: Micropolar Continua and beyond, Technische Universität Berlin,

Mechanical Characteristics of Carbon Nanotubes: Micropolar Elasticity Models and Molecular Dynamics Simulations under Torsion and Bending

[Italy, Rome, 19/09/2022 – 23/09/2022]

Nanoinnovation 2022 Conference and Exhibition

Invited Speaker

Determination of C60 Young's modulus using molecular dynamics simulations and inverse method

[Iran, Tehran, 29/04/2019 – 30/04/2019]

27th Annual International Conference of Iranian Society of Mechanical Engineering, ISME 2019.

Link: <https://civilica.com/doc/906901>

Experimental and Numerical Analysis of Thermoplastic Laminates Reinforced with Jute Fabric

[Italy, Rome, 21/02/2023]

The 27th International Conference on Fracture and Structural Integrity

ORGANISATIONAL SKILLS

Reviewer

Reviewer for

"Composite Structures, Elsevier" (2 Reviews)

"Iranian Journal of Science and Technology, Transactions of Mechanical Engineering, Springer" (4 Reviews)

"Nonlinear Dynamics, Springer" (1 Review)



"Journal of Nanomaterials, Nanoengineering and Nanosystems, SAGE" (1 Review)

"International Journal for Multiscale Computational Engineering, Begell House" (1 Review)

"The Third International Nonlinear Dynamics Conference (NODYCON 2023)" (1 Review)

Co-Organizer

mini-symposium on "Bridging the Gap between Atomistic Modelling and Continuum Mechanics" as a part of the "Nanoinnovation Conference and Exhibition 2023" (www.nanoinnovation.eu)

September, 18-22, 2023, Rome, Italy

SELECTED COURSES

Selected Courses

- Multiscale Modelling in Composites, September 20-21-22, Department of structural and geotechnical Engineering, Sapienza University of Rome, Italy
- Finite Element Method: 19/20 (1st grade), Department of Mechanical Engineering, Shiraz University, Iran
- Composite Materials: 18/20 (1st grade), Department of Mechanical Engineering, Shiraz University, Iran
- Energy Methods: 18/20 (1st grade), Department of Mechanical Engineering, Shiraz University, Iran
- Continuum Mechanics: 18/20 (1st grade in midterm, 2nd grade in final), Department of Mechanical Engineering, Shiraz University, Iran
- Computer programming: 20/20, Department of Mechanical Engineering, Shiraz University, Iran

HONOURS AND AWARDS

Honours and awards

- Ranked 7th among more than 1000 participant in Iranian university entrance exam for PHD degree in solid mechanics of mechanical engineering, Iran
- Ranked 3rd between 29 students of solid mechanics in the Master's program, Shiraz, Iran
- Ranked as the 5th top student between 50 students of applied mechanics at the end of Bachelor's, Shiraz, Iran
- Entered the Master's without entrance exam considered for graduating top students in the Bachelor program.
- Ranked within the top 0.3 % among approximately 312,000 participants in the National Entrance Examination for Iranian universities, Iran
- Accepted to take part in "Mathematics Olympiad Stage 2" from top 5% of participants in "Mathematics Olympiad Stage 1" for in all three years of high school, Iran
- Accepted to take part in "Literature Olympiad Stage 2" from top 5% of participants in "Literature Olympiad Stage 1", Iran

WORKSHOPS

Workshops

- 2 day workshop on molecular dynamics simulation (LAMMPS), Nov. 2014, Tehran, Iran
- 3-hour on-line workshop on molecular dynamics simulation with LAMMPS, Nov. 2020, Nano-education foundation, Iran
- 3-hour on-line workshop on Introduction to polymeric nanocomposites, Oct. 2021, Nano-education foundation, Iran
- 12-hour workshop on an introduction to the requirements of the quality management system in the laboratory under ISO/IEC 17025:2005 standard, July 2017, Shiraz, Iran
- 6-hour workshop on introduction to internal audit of laboratory quality management system based on ISO 17025, Feb. 2018, Shiraz, Iran
- 6-hour workshop on quality assurance of test results, Sept. 2017, Shiraz, Iran
- 8-hour workshop on introduction to uncertainty calculation, Jan. 2018, Shiraz, Iran
- 8-hour workshop on fundamentals of strategic programming, June 2017, Shiraz, Iran
- 16-hour workshop on "5S", March 2017, Shiraz, Iran
- 8-hour workshop general safety training course, Dec. 2018, Shiraz, Iran



- 75-hour workshop on design and supervision of electrical and mechanical building installations, 2019-2020, Shiraz, Iran

PROJECTS

Industrial Projects

As an R&D expert, I have been managed and contributed to numerous industrial projects; the main ones are listed below:

- Project manager of "Design and Production of Bushing 245 kV with Silicone Rubber Insulator", 2018
This product has been produced in Iran for the first time. The product got his type test certificate from an accredited international laboratory in Croatia where I was on the mission as the test supervisor.
- Mechanical analyst and designer in "Standard CVT kV245 and 420kV with Composite Insulator" project, 2017
This project was collaborated with University of Tehran.
- Mechanical analyst and designer in "Combined Instrument Transformer 36 kV" project, 2016
- Mechanical design of special mold for resin-made current transformer, 2015

Academic projects

- Dynamic Analysis of a triangular plate with a hole in the middle and supported by a beam using FEM programming in MATLAB, 2013 (FEM course),
Plastic analysis of a thin-walled cylinder under combined internal pressure and torsional load with different load histories , 2013 (plasticity theory course),
- Optimisation of a rectangular plate with two holes under buckling load using ANSYS APDL, 2011
- Designing, building and simulating a fruit slicer parallel motion mechanism, 2011 (design of machinery course)

DIGITAL SKILLS

Atomistic simulations using Large-scale AtomicMolecular Massively Parallel Simulator (LAMMPS) / VMD Visual Molecular Dynamics / Materials Studio / AutoCad / Solidworks / ANSYS Workbench, ANSYS APDL / Microsoft Office (Word, Excel, Powerpoint, Visio) / LATEX / Ovito - Visualization Tool

MEMBERSHIP

Membership

- Expert of International Electronic Committee (IEC), 2021
- Member of Fars Construction Engineering Organization, 2020
- Member of Iranian National Electrotechnical Committee (INEC), 2017 to present
- Member of Scientific Association of Mechanical Department, 2009

LANGUAGE SKILLS

Mother tongue(s): **Persian**

Other language(s):

English

LISTENING C2 READING C2 WRITING C2

SPOKEN PRODUCTION C2 SPOKEN INTERACTION C2

Italian

LISTENING A2 READING A2 WRITING A2

SPOKEN PRODUCTION A2 SPOKEN INTERACTION A2



REFERENCES

Recommendation

1. Prof. Patrizia Trovalusci, Full Professor, Department of Structural and Geotechnical Engineering, Sapienza University of Rome, Rome, Italy, Email: patrizia.trovalusci@uniroma1.it
2. Dr. Nicholas Fantuzzi, Associate Professor, Department of Mechanical Engineering, Alma Mater Studiorum, University of Bologna, Bologna, Italy. Email: nicholas.fantuzzi@unibo.it
3. Prof. Ali Nayebi, Full Professor, Department of Mechanical Engineering, Shiraz University, Shiraz, Iran. Email: nayebi@shirazu.ac.ir
4. Dr. Esmaeel Ghavanloo, Associate Professor, Department of Mechanical Engineering, Shiraz University, Shiraz, Iran. Email: ghavanloo@shirazu.ac.ir
5. Eng. Ali Asghar Adlband, former R&D department manager, Nirou Trans Company, Shiraz, Iran. Email: adlband@niroutrans.com
6. Eng. Mahdi Zargarbashi, R&D department manager, Nirou Trans Company, Shiraz, Iran. Email: zargarbashi@niroutrans.com