

## PERSONAL INFORMATION

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Name Dr. Morteza Karamooz Mahdiabadi  
Assistant Professor, Lab Director

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## WORK EXPERIENCE

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**Since 09/2021** **Tarbiat Modares University**, Faculty of Mechanical Engineering, Tehran, **Iran**  
Assistant Professor, Head of Sound and Vibration Lab.

**09/2019 – 09/2021** **ETH Zurich**, Chair of Nonlinear Dynamics, Zurich, **Switzerland**  
Postdoctoral Fellow

**09/2014 – 07/2019** **Technical University of Munich**, Chair of Applied Mechanics, Munich, **Germany**  
Research Assistant and PhD candidate,

**09/2013 – 09/2014** **Aletaha Institute**, Tehran, **Iran**  
Lecturer: Statics, Applied Mathematics, Physics (Mechanics)

**07/2009 – 09/2009** **Iranian Organization of Renewable Energies**, Tehran, **Iran**  
Internship: Project assistant

## EDUCATION

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**06/2019** **PhD, Mechanical Engineering**,  
**Munich, Germany** Technical University of Munich (TUM)

**05/2012** **M.Sc., Mechanical Engineering**,  
**Tehran, Iran** Tarbiat Modares University

## RESEARCH INTERESTS

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- Vibrations, Nonlinear Dynamics
- Structural Dynamics
- Artificial Intelligence in Engineering Design
- Structural Health Monitoring
- Smart Structures
- Vibration-based System Identification and Model Updating

## TEACHING

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- Since 2021
- **Nonlinear Vibrations** (M.Sc., PhD), Tarbiat Modares University
  - **Modal Analysis in Mechanical Systems** (M.Sc., PhD), Tarbiat Modares University
  - **Sensors and Actuators** (M.Sc., PhD), Tarbiat Modares University
- Since 2020
- **Smart Structures** (M.Sc., PhD), Tarbiat Modares University
  - **Vibration of Continuous Systems** (M.Sc., PhD), Tarbiat Modares University
- 2016/17/18
- **Lab on Structural Dynamics** (M.Sc.), Lecturer and TA, Technical University of Munich
- 2015/16
- **Structural Dynamics** (M.Sc.), TA, Technical University of Munich
- 2013/14
- **Statics, Applied Mathematics, Physics (Mechanics)** (B.Sc.), AleTaha Institute of Higher Education

## STUDENT SUPERVISION

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### PhD. Supervision:

1. Yoosef Ghobad, "Energy flow analysis of sandwich panels with auxetic core in high frequency vibrations", Co-supervised with Prof. A. Farrokhhabadi, Tarbiat Modares University, Since 2022
2. Hamideh Tavakoli, "Experimental and numerical static and vibration analysis of shape memory multi-layer sandwich panels", Co-supervised with Prof. A. Farrokhhabadi, Tarbiat Modares University, Since 2023

### M.Sc. Supervision:

1. Mahammadreza Tahmasbian, "Intelligent condition motoring in rotating machineries", Tarbiat Modares University, Since 2022
2. Amin Ghasemi, "Stochastic nonlinear modeling and analysis of Rotor-Disc-Bearing system", Tarbiat Modares University, Since 2022
3. Majid Ghazali, "Structural damage detection and localization in composite plates using piezoelectric patches and machine learning", Tarbiat Modares University, Since 2022
4. Marie Zaheri, "Operational modal analysis and modal uncertainty quantification of a thin rectangular plate using noncontact excitation", Tarbiat Modares University, Since 2022
5. Hossein Najafi, "Nonlinear structural dynamics analysis with Simulation-free load-independent hyper-reduction approach", Tarbiat Modares University, Since 2021
6. Mohammad Landarani, "Modeling and optimization of soft magnetic robots", Tarbiat Modares University, 2022.
7. Jingjie Yang; "Response Prediction of Nonlinear Finite Elements with Model Order Reduction: Enhancement with Non-intrusive Quadratic Manifold", Technical University of Munich, 2019.
8. Gladson Tabod; "Non-intrusive dynamic substructuring of geometric nonlinear finite element models", (Semester Thesis) Technical University of Munich, 2019.
9. Antoine Brandt; "Non-intrusive model order reduction of geometrically nonlinear FEMs using linear manifold", Technical University of Munich, 2018.

10. Mustapha Kassem; "Reduced Order Models for Geometric Nonlinear FEMs unter Thermal Loads Using Dual Modes", (Semester Thesis) Technical University of Munich, 2018.
11. Philipp Schäfer; "Efficient Hyper-Reduction in Geometrical Nonlinear Finite Element Analysis", (Semester Thesis) Technical University of Munich, 2018.
12. Shubhra Shitole; "Component Mode Sythesis Strategies in Cyclic Symmetric Structures", Technical University of Munich, 2018.
13. Syahrindra Sofyan; "Evaluation of Component Mode Synthesis Methods based on Higher Order Static Correction Modes with Interface Reduction", (Semester Thesis) Technical University of Munich, 2018.
14. Duo Xu; "Hyper reduction of geometric nonlinear finite element models using quadratic manifold method", Technical University of Munich, 2018.
15. Francesco De Crescenzo; "Model reduction of geometric nonlinear finite element models with thermoelastic coupling", Technical University of Munich, 2017.
16. Yan Zhu; "Nonintrusive Structural Dynamic Reduced Order Modeling for Large Deformations: Enhancements with Tangent Stiffness", Technical University of Munich, 2017.
17. Hao Xing; "Uncertainty Quantification in Frequency Based Substructuring", (Semester Thesis) Technical University of Munich, 2017.
18. Yongle Qi; "Experimental-Analytical Substructuring in Dual Form Using the Transmission Simulator Method", Technical University of Munich, 2017.
19. Sissi Bazan; "Noise Cancellation in Frequency Based Substructuring Using Singular Value Decomposition", (Semester Thesis) Technical University of Munich, 2017.
20. Erhard Buchmann; "Dynamic substructuring and interface reduction in geometric nonlinear finite element models", Technical University of Munich, 2016.
21. Marco Falco; "Dynamic Substructuring of Nonlinear Structures Using Nonlinear Normal Modes", Technical University of Munich, 2016.
22. Duo Xu; "Dynamic Substructuring of Geometrically Nonlinear FEMs Using Craig-Bampton Method as a Linear Basis", (Semester Thesis) Technical University of Munich, 2016.
23. Bryndis Eliasdottir; "Experimental-Numerical dual Coupling in Dynamic Substructuring: Application to Wind Turbines", Technical University of Munich, 2016.
24. Nima Alaei; "Application of damage detection using substructuring in wind turbines", Technical University of Munich, 2016.
25. Duo Xu; "Model Updating of Wind Turbine Components: comparison of different model updating approaches", (Student work) Technical University of Munich, 2015.
26. Johanna Haumann; "Experimental vibration analysis of a wind turbine testbed", (Student work) Technical University of Munich, 2015.

## RESEARCH ARTICLES

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1. Jamshiddoust, A, Karamooz Mahdiabadi, M., Farrokhabadi, A., The anisotropic effects of piezoelectric patch on the efficiency of vibration energy harvesting in a multilayer composite plate, *Intelligent material systems and structures*, 2023, Submitted.
2. Javanbakht, A, Karamooz Mahdiabadi, M., "Vibration analysis of functionally graded nanobeams using various shear deformation theories based on Doublet Mechanics", *Composite Structures*, 2023, Submitted.
3. Tiso, P., Karamooz Mahdiabadi, M., Marconi, "Modal methods for reduced order modeling", Book chapter, de Gruyter, 2021
4. Karamooz Mahdiabadi, M., Tiso, P., and Rixen, D. J. "An Enhanced modal substructuring of geometric nonlinear structure based on non-intrusive methods". In preparation for AIAA (2021).

5. Karamooz Mahdiabadi, M., Brandt, A., Tiso, P., and Rixen, D. J. "An improved non-intrusive model-order reduction of geometric nonlinear structural dynamics using modal derivatives". *Mechanical Systems and Signal Processing* (2021).
6. Bartl, A., Karamooz Mahdiabadi, M., Insam, C., Mayet, J., Rixen, D.J., "A hybrid testing method based on adaptive feed-forward filters", *Mechanical Systems and Signal Processing* (2020), 139, art. no. 106586,
7. Karamooz Mahdiabadi, M., Bartl, A., Xu, D., Tiso, P., and Rixen, D. J., An augmented free-interface-based modal substructuring for nonlinear structural dynamics including interface reduction, *Journal of Sound and Vibration* 462 (2019) 114915. <https://doi.org/10.1016/j.jsv.2019.114915>.
8. Meyer, C. H., Lerch, C., Karamooz Mahdiabadi, M., and Rixen, D. "Efficient basis updating for parametric nonlinear model order reduction". In: *PAMM* 18.1 (2018), e201800075. DOI: 10.1002/pamm.201800075.
9. Karamooz Mahdiabadi, M., De Crescenzo, F., Meyer, C. H., and Rixen, D. J. "Evaluation of the Reduced Order Models for Thermoelastodynamic Response of Geometrically Nonlinear Finite Element Models". In: *PAMM* 18.1 (2018), DOI:10.1002/pamm.201800383.
10. Karamooz Mahdiabadi, M. and Rixen, D. J. "Non-intrusive model-order reduction of geometrically nonlinear finite elements: enhancement with static augmentation". In: *Proceedings of ISMA2018 including USD2018*. KU Leuven, 2018.
11. Karamooz Mahdiabadi, M., Buchmann, E., and Rixen, D. J. "Modal Substructuring of Geometrically Nonlinear Plates". In: *PAMM* 17.1 (2017), pp. 515–516. ISSN: 1617-7061. DOI: 10.1002/pamm.201710227.
12. Karamooz Mahdiabadi, M., Qi, Y., and Rixen, D. J. "Experimental-Numerical Substructuring: a Comparison of Assemblies in Primal and Dual Forms". In: *PAMM* 17.1 (2017), pp. 3–6. ISSN: 1617-7061. DOI: 10.1002/pamm.201710002.
13. Bartl, A.; Karamooz Mahdiabadi, M.; Rixen, D.J.: Conception of a Noise and Vibration Hardware-In-The-Loop Test Bed, *IMAC, 35th A Conference and Exposition on Structural Dynamics*, California, 2017, USA.
14. Bazan, S.; Karamooz Mahdiabadi, M.; Rixen D.J.; Noise Elimination in Lagrange Multiplier Frequency Based Substructuring, *35th IMAC, A Conference and Exposition on Structural Dynamics*, California, USA.
15. Falco, M., Karamooz Mahdiabadi, M., and Rixen, D. J. "Nonlinear Substructuring Using Fixed Interface Nonlinear Normal Modes". In: *Dynamics of Coupled Structures, Volume 4*, Springer International Publishing, 205-213. Springer. 2017. DOI: 10.1007/978-3-319-54930-9\_18.
16. Karamooz Mahdiabadi, M., Buchmann, E., Xu, D., Bartl, A., and Rixen, D. J. "Dynamic Substructuring of Geometrically Nonlinear Finite Element Models Using Residual Flexibility Modes". In: *Dynamics of Coupled Structures, Volume 4*, Springer International Publishing, 215-223. Springer. 2017. DOI: 10.1007/978-3-319-54930-9\_19.
17. Bab, S., Khadem, S., Karamooz Mahdiabadi, M., and Shahgholi, M. "Vibration mitigation of a rotating beam under external periodic force using a nonlinear energy sink (NES)". In: *Journal of Vibration and Control* 23.6 (2017), pp. 1001–1025. DOI: 10.1177/1077546315587611.
18. Linderholt, A., Abrahamsson, T., Johansson, A., Karamooz Mahdiabadi, M., and Rixen, D. J. "The Dynamic Behavior of Three Sets of the Ampair 600 Wind Turbine". In: *Proceedings of the 34rd IMAC, A Conference and Exposition on Structural Dynamics*, 2016. Springer. 2016.
19. Bartl, A., Wernsen, M., Karamooz Mahdiabadi, M., and Rixen, D. J. "Interface State Estimation for Hardware-In-The-Loop Tests of Structural Dynamic Systems". In: *Proceedings of the 27th ISMA, A Conference on Noise and Vibration Engineering*. KU Leuven, 2016.

20. Eliasdottir, B. B., Karamooz Mahdiabadi, M., Bartl, A., and Rixen, D. J. "An Experimental-Numerical Substructuring Approach in Dual Form". In: Proceedings of the 27th ISMA, A Conference on Noise and Vibration Engineering. KU Leuven, 2016.
21. Bartl, A., Mayet, J., Karamooz Mahdiabadi, M. M., and Rixen, D. J. "Multi-DoF Interface Synchronization of Real-Time-Hybrid-Tests using a Recursive-Least-Squares Adaption Law: A Numerical Evaluation". In: Proceedings of the 34rd IMAC, A Conference and Exposition on Structural Dynamics, 2016. Springer. 2016.
22. Xu, D., Karamooz Mahdiabadi, M. M., Bartl, A., and Rixen, D. J. "A Comparison of Common Model Updating Approaches". In: Proceedings of the 34rd IMAC, A Conference and Exposition on Structural Dynamics, 2016. Springer. 2016.
23. Karamooz Mahdiabadi, M. M., Bartl, A., and Rixen, D. J. "Effect of Interface Substitute when Applying Frequency Based Substructuring to the Ampair600 Wind Turbine Rotor Assembly". In: Proceedings of the 34rd IMAC, A Conference and Exposition on Structural Dynamics, 2016. Springer. 2016.
24. Foumani, M.S.; Khatibi, M.M.; Moradi, M.M; Karamooz Mahdiabadi, M.; Kinematic-Kinetic Analysis of Humanoid Robot Straight Motion, Journal of Modeling in Engineering, Vol. 7, No. 17, 17-25, 2009.

## INDUSTRY PROJECTS

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1. Non-contact operational modal analysis and uncertainty quantification in structures. Project manager, 2023, ongoing
2. Operational modal analysis of large structure using artificial neural network, Project manager, 2023, ongoing
3. Structural damage detection and localization in composite structures machine learning, Project manager 2023, ongoing
4. Operational modal analysis of a subway train, Project manager, 2022, completed.
5. Design and analysis of a pneumatic damper, Project manager, 2021, completed
6. Aero-Thermo-Elastic Nonlinear Reduced Order Modeling for Hypersonic Airframes, Project engineer, 2021, completed

## RESEARCH TALKS

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About 20 research talks in international conferences and different events in USA, Germany, Belgium, Switzerland and Iran.

## SOFT SKILLS

07/2019	<b>Basics in Business Administration,</b> Prof. Dr. Dominik Hammer, TUM Graduate School, Garching
01/2017	<b>Fundamentals of project management,</b> Judith Bergner, Department of Mechanical Engineering Graduate School, TUM, Garching
06/2016	<b>Surviving Complex Project (Complex Project Managment),</b> Dr. Thomas Becker, TUM Graduate School, Garching
07/2015	<b>Develop your Entrepreneurial Thinking</b> Rebecca Preller and Inga vom Holtz, TUM Graduate School, Frauenchiemsee
07/2015	<b>Scientific Paper Writing,</b> Dr. Aniko Balazs, TUM Graduate School, Garching
05/2015	<b>Successfully Communication in an International Research Group,</b> Eliza Skowron, TUM Graduate School, Garching
10/2015	<b>Fit in Teaching,</b> Department of Mechanical Engineering Graduate School, TUM, Garching

## PROFICIENCIES

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### PC

**Very Good:** Matlab (m-file, simulink), Abaqus, Ansys, LaTeX, Inkscape, Maple

**Good:** Python, CATIA, C++, Nastran/Patran, COSMOS, Adams, Fluent

**Basic Knowledge:** AutoCAD, Solidworks

### Laboratory

**Very Good:** dSpace, Modal Testing software (LMS, Pulse), Test rig design and construction

### Languages

**German** (Full proficiency, C1), **English** (Full proficiency, C1)

**Persian** (Mother tongue)

### Awards

2016

STIPET Scholarship for teaching, TU Munich

### Volunteer

Buddies for refugees, WS 16/17, SS 17, TU Munich

Member of the Iranian student council for mechanical engineering (ISME), (2006-2009)

### Hobbys

Biking, Wandering, Traveling

Morteza Karamooz Mahdiabadi,

Tehran, 31.07.2023