

Educational Background

- **Ph.D. in Mechanical Engineering**, Department of Aerospace and Mechanical Engineering, College of Engineering, The University of Arizona, Tucson, AZ, US, 2016 - 2022, GPA: 4.0
- **M.S. in Mechanical Engineering**, School of Mechanical Engineering, College of Engineering, The University of Tehran, Tehran, Iran, 2011 - 2014
- **B.Sc. in Mechanical Engineering**, Department of Mechanical Engineering, College of Engineering, The University of Kerman, Kerman, Iran, 2005 - 2011

Working Experience

- **Assistant Professor**, James Worth Bagley College of Engineering, Department of Mechanical Engineering, Mississippi State University, Starkville, MS, US, 2023 - Current
- **Postdoctoral Research Associate**, School of Mechanical Engineering, Purdue University, West Lafayette, IN, US, March 1st, 2022 - Aug 10th, 2023

Fields of Interest

- Nonlinear Dynamic, Bifurcation, Chaos Theory
- Mechanical Vibrations in Linear/Nonlinear Discrete/Continuous Systems
- Nonlinear Adaptive/Robust Control Systems Design
- Robotics, Mechatronics, Digital Control, Automation, and Autonomous Systems
- Gyroscopic Systems, Nonholonomic Systems, Under Actuated Systems
- Computational Multibody 2D/3D Dynamic Systems
- Mechanical Property and Stability of Elastic Material, Finite Elements Methods
- Structural Dynamics, Fluid-Structure Interactions

Applications

- Rigid Multi-Body Fluid-Structure Interactions (RMB FSI).
- Energy harvesting, vibration absorption, nonlinear energy sink, MEMS and NEMS resonators.
- Self-excited and parametrically excited systems, gyroscopic systems, nonholonomic systems, under actuated systems.
- Perturbation analysis of nonlinear, time-periodic, time-delayed, stochastic, and fractional system of coupled equations.
- Vibration-based health monitoring and damage detection of structures & rotating machinery.
- Quadcopters, Legged Robots, Bio-inspired Robots, Rehabilitation Robots, 3D Mechanisms.
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Rewards and Honors

- Outstanding Graduate Teaching Assistant, Department of Aerospace and Mechanical Engineering, The University of Arizona, Spring 2021.

Funded Research Grant

- National Aeronautics and Space Administration (NASA), Collaborative Research, To develop the technologies needed to establish Resilient Extraterrestrial Habitats, \$75,000, Sep1, 2023 – Aug 31, 2024, PI: Shirley Dyke from Purdue University
- Global Development Seed Grant Award (GDSG), Numerical, Analytical, and Experimental Analysis on Improving the Efficiency of the Bladeless Wind Turbine, \$10,000 (50% GDSG & 50% MS State), Jan 1, 2024 – Dec 31, 2024, PI: Mohsen Azimi
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Computer Skills

- Proficient in MATLAB and SOLIDWORKS
- Familiar with Ansys, AutoCAD, CATIA, C++

Practical Skills

- Proficient in implementing digital electronic circuits, programming microcontrollers in C and Assembly languages, and software-hardware interface
- Proficient in 3D printing
- Familiar with CNC Machines
- Familiar with Hydraulic and Pneumatic systems
- Familiar with PLC programming, integration, and fault detection

Subject Areas Taught

Graduate level

- Advanced Dynamics, Advanced Vibration, Advanced Control, Digital Control
- Nonlinear Dynamics, Nonlinear Vibration, Nonlinear Control
- Advanced Engineering Analysis, 3D Multibody Dynamic Systems

Undergraduate level

- Dynamic, Dynamics of Machinery, Design of Mechanisms, Mechanical Vibration, Classic Control
- Mechatronics, Robotics, 2D Multibody Dynamic Systems
- Engineering Analysis, Differential Equations, Numerical Methods
- Statics, Engineering Materials, Finite Element Methods

Professional Experiences

Research Experiences

Department of Mechanical Engineering, Mississippi State University, Starkville, Mississippi, US, 2023 - Current

- Energy harvesting in offshore area, and bladeless wind turbine

School of Mechanical Engineering, Purdue University, West Lafayette, Indiana, US, 2022 - Current

- Safety Control and Trade Study of a Resilient Deep Space Habitats

Ridgetop Group Inc. 3580 W Ina Rd, Tucson, AZ 85741-2276, US

- Piezoelectric Energy Harvesting in Rotary Machinery, 2021 - 2022
- Real Time Health Monitoring of Geared Systems via Shaft Mounted Wireless Accelerometer, 2018 - 2021

Department of Aerospace and Mechanical Engineering, University of Arizona, Tucson, Arizona, US

- Energy Harvesting in System of Nonlinear Oscillators with Strong Coupling, 2021 - 2022
- Stability and Bifurcation in System of Nonlinear Parametrically Excited Coupled Equations; with Application to Geared Systems, Fall 2018 - 2021
- Dynamic Analysis and Simulation of Nanofiber in Electrospinning Process, Dr. Eniko Enikov, Fall 2016 - 2018

School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran, Iran

- Dynamic Modelling and Controlling of Bio-inspired Legged Robots, Dr. Hairi Yazdi, 2011 - 2014

Teaching Experiences

Department of Mechanical Engineering, Mississippi State University, Starkville, Mississippi, US

- Mechatronic Systems, Spring 2024
- Introduction to Vibration and Control, Fall 2023-2024

Department of Aerospace and Mechanical Engineering, University of Arizona, Tucson, Arizona, US

- Control System Design, Summer 2018-19
- Dynamics of Machines, Summer 2018-21
- Mechanical Vibration, IPSA Exchange Program, Fall 2019
- Mechatronics, IPSA Exchange Program, Fall 2017-19
- Mechanical Vibration Lab, IPSA Exchange Program, Fall 2017-19

Teaching Assistant Experiences

Department of Aerospace and Mechanical Engineering, University of Arizona, Tucson, Arizona, US

- Advanced Engineering Analysis, Prof. Barry D. Ganapol, Spring 2022
- Engineering Analysis, Dr. Wane Hacker, Fall 2021
- Control System Design, Prof. Eniko T Enikov, Fall 2020 & Spring 2021
- Advanced Control, IPSA Exchange Program, Prof. Eniko T Enikov, Fall 2019
- Dynamics, Dr. Paul Reverdy, Spring 2019 & Dr. Wayne Hacker, Fall 2020
- Dynamics of Machines. Prof. Erick Butcher, Fall 2018
- Mechatronics, Prof. Eniko T Enikov, Spring 2017-18 & 2020-22
- Numerical Methods, Prof. Barry D. Ganapol, Spring 2017, Fall 2021
- Mechanical Vibrations, Dr. Morad Nazari, Fall 2016

School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran, Iran

- Dynamics and Mechanical Vibrations Lab, Dr. M. R. Zakerzadeh, Spring & Fall 2013, Spring 2014
- Engineering Materials, Dr. Abolfazl Masoumi, Spring 2013

College of Science, University of Tehran, Tehran, Iran

- Dynamics and Vibration Laboratory, Dr. Reza Zakerzadeh, Spring & Fall 2013, Spring 2014
- Engineering Analysis, Dr. Ahmad Fiez Dizaji, Fall 2013
- Physics, Dr. Dariani, Fall 2013

List of Publications

Journal Papers in Progress

- Mohsen Azimi, Alana Lund, Yuguang Fu, Herta Montoya, Luca Vaccino, Murali Krishnan, SeungHo Rhee, Leila Chebbo, Adnan Shahriar, Zixin Wang, Amin Maghareh, Shirley J. Dyke, (2023) “HabSim: A Modular Coupled Virtual Testbed for Simulating ExtraTerrestrial Habitat Systems,” *American Institute of Aeronautics and Astronautics*.
- Luca Vaccino, Mohsen Azimi, Shirley J. Dyke, Dawn Whitaker, (2023), “Exploring Contingency Responses to Disruptive Events During Transitions in Deep Space Missions,” *American Institute of Aeronautics and Astronautics*.
- Luca Vaccino, Alana K. Lund, Shirley J. Dyke, Mohsen Azimi “Modelling Disruption, (2023), Detection, Propagation, and Repair for Multi-physics Deep Space Habitat,” *Advances in Engineering Software*.
- Saeid Nazari, Mohsen Azimi, “Bipedal Robot Joint Trajectory Generation for Predetermined ZMP”
- Mohsen Azimi, Qiuchen Zhang, Eniko T Enikov, “System Identification, Control and Stability of Bicopter; a Simplified Model to Identify Quadcopter Dynamic Characteristics.”

Conference Paper in Progress

Journal Papers Published

- R Murali Krishnan, Kairui Hao, Sreehari Manikkan, Jiachen Wang, Chuanyu Xue, Zixu Zhang, Mahira Morris, Mohsen Azimi, Paul Parsons, Song Han, Ilias Bilonis “MCVT-HMS: A Model-based Systems Engineering Testbed for Investigating Situational Awareness and Autonomy for Resilient Deep-space Habitation”
- Zixin Wang, Mohammad R. Jahanshahi, Mohsen Azimi, Shirley J. Dyke, (2023), "Sensor Fault Detection in Smart Extraterrestrial Habitats Using Unsupervised Learning," *American Institute of Aeronautics and Astronautics*.
- Mohsen Azimi, Eniko T Enikov, “Implementation of Shaft-Mounted Accelerometer in the Local Fault Diagnosis of Geared Systems.” IMAC 2023
- Mohsen Azimi, “Pitchfork and Hopf Bifurcation of Geared Systems with Nonlinear Suspension in Permanent Contact Regime” *Nonlinear Dynamics*. Springer Netherlands. doi: <https://doi.org/10.1007/s11071-021-07110-x>
- Mohsen Azimi, “Parametric Stability of Geared Systems with Linear Suspension in Permanent Contact Regime” *Nonlinear Dynamics*. Springer Netherlands. doi: 10.1007/s11071-021-06943-w.
- Mohsen Azimi, “Parametric Frequency Analysis of Mathieu-Duffing Equation,” *International Journal of Bifurcation and Chaos*, vol. 31, no. 12, 2021, doi:10.1142/S0218127421501819.
- Mohsen Azimi, “Stability and Bifurcation in Mathieu-Duffing Equation,” *International Journal of Non-Linear Mechanics*, <https://doi.org/10.1016/j.ijnonlinmec.2022.104049>.
- Mohsen Azimi, and M.R. Hairi Yazdi, “Energy Dissipation Rate Control and Parallel Equations Solving Method for Planar Spined Quadruped Bouncing Robot,” *Journal of Mechanical Science and Technology (JMST)*, vol. 31, no. 2, pp. 875–884, 2017.
- Mohsen Azimi, and M.R. Hairi Yazdi - “Energy Dissipation Rate Control via a Semi-Analytical Pattern Generation Approach for Planar Three-Legged Galloping Robot based on the Property of Passive Dynamic Walking,” *Journal of Applied Mechanics (JAMECH)* 46, no 1 (2015) 31-39

Conference Paper Published

- Mohsen Azimi et al. “Challenges in the Decommissioning of a Resilient Smart Deep Space Habitat” ICES, 2024
- Vaccino, L., Pritchard, K., Azimi, M., Dyke, S., Lund, A. (2023). “Simulation-Based Assessment of Hazardous States in a Deep Space Habitat.” *Detection, Propagation, and Repair for Multi-Physics Deep Space Habitat*. <https://hdl.handle.net/2346/94795>
- Azimi, M., Enikov, E. T., Pena, W. (2023). “Implementation of Shaft-Mounted Accelerometer in the Local Fault Diagnosis of Geared Systems.” *Society for Experimental Mechanics Annual Conference and Exposition*, (pp. 31-54).
- Mohsen Azimi, and M.R. Hairi Yazdi, “Energy Dissipation Rate Control for Planar Quadruped Bouncing Robot Based on the Property of Passive Dynamic Walking,” The 2nd RSI International Conference on Robotics & Mechatronics (ICRoM), Tehran, October 15-17, 2014.
- Mohsen Azimi, and M.R. Hairi Yazdi, “Energy Dissipation Rate Control for Planar Biped Walking Robot Based on the Property of Passive Dynamic Walking”, IMECH2014 - ASME2014 International Mechanical Engineering Congress and Exposition, Montreal, November 14-20, 2014