MohammadAli BagherzadehKouhbanani

Graduate University of Advanced Technology, Faculty of Electrical and Computer Engineering

ma.bagherzadeh@kgut.ac.ir **+989133102677**

0000-0001-6400-5896 **mohammadali-bagherzadeh**

EDUCATION

Ph.D. in Electrical Engineering; (September 2010 - January 2016)
Isfahan University of Technology, Isfahan, Iran.
Ph.D. Thesis: "Robust stability analysis and stabilization of switched linear systems with parametric uncertainties"

- **Supervisors:** Prof. Jafar Ghaisari (ghaisari@iut.ac.ir) and Prof. Javad Askari (j-askari@iut.ac.ir)
- **Advisor:** Prof. Mohsen Mojiri (mohsen.mojiri@iut.ac.ir)

M.Sc. in Electrical Engineering (Control); (September 2008 – July 2010)
Isfahan University of Technology, Isfahan, Iran.
M.Sc. Thesis: "Input to state stability analysis and switching signal design for switched control systems"

- **Supervisor:** Prof. Jafar Ghaisari (ghaisari@iut.ac.ir)
- **Advisor:** Prof. Javad Askari (j-askari@iut.ac.ir)

B.Sc. in Electrical Engineering (Control); (September 2003 – September 2008)
Isfahan University of Technology, Isfahan, Iran.
B.Sc. project: "Design and implementation of a poultry farm monitoring system"

- **Supervisor:** Prof. Farid Sheikholeslam (sheikh@iut.ac.ir)

PROFESSIONAL EXPERIENCE

Assistant Professor (September 2018 - Present)
Department of Electrical and Computer Engineering, Graduate University of Advanced Technology, Kerman, Iran.

Research And Development Manager (January 2023 - Present)
Mahan Petro Vista Mehr, Kerman, Iran.

Head of Industry Relations Office (May 2019 – December 2020)
Graduate University of Advanced Technology, Kerman, Iran.

Assistant Professor (September 2017 - September 2018)
Department of Electrical and Computer Engineering, Arak University of Technology, Arak, Iran.

Senior Researcher and Internal Manager (September 2015 - September 2017)
Research Center for Industrial Control and Automation, Isfahan University of Technology, Isfahan, Iran.

Course Instructor & Teaching Assistant (September 2008 - Jun 2018)
Isfahan University of Technology, Isfahan, Iran.

Course Instructor (January 2016 - December 2017)
Islamic Azad University, Boroujen Branch, Boroujen, Iran.

PUBLICATIONS

Journal Papers

- **M.A. Bagherzadeh**, and H. Kourki. "Robust Stability Analysis of Discrete-Time Switched Linear Systems with Dwell Time and Mode-Dependent Dwell Time Switching." *Iranian Journal of Science and Technology, Transactions of Electrical Engineering* (2023): 1-17.
- F. Khosrojerdi, H. Kourki, and **M.A. Bagherzadeh**. "The evaluation of the relationship between the microstructure and properties of the tire tread containing carbon black/silica hybrid nanoparticles." *Journal of Composite Materials* 57.25 (2023): 3953-3964.

- H. Kourki, F. Khosrojerdi, and **M.A. Bagherzadeh**. "The Impact of Adding Nanosilica to Tire Formulation on Rolling Resistance and Air Pollution." *Journal of Urban Management & Environmental Engineering* Vol. 1, No. 3, pp. 1-13, 2023 (in Farsi).
- S. GoruhiPour, **M.A. Bagherzadeh**, E. Soleimani-Nasab, and H.Vahidi. "Wireless Configuration for Smart Greenhouse Automation: An Economical and Efficient Approach." *Journal of Urban Management & Environmental Engineering* Vol. 1, No. 2, pp. 46-64, 2023 (in Farsi).
- **M.A. Bagherzadeh**, J. Ghaisari. "Reducing conservatism in robust stability analysis and stabilisation of arbitrary switched linear systems." *IET Control Theory & Applications* Vol. 16, No. 6, pp. 638-647, 2022.
- **M.A. Bagherzadeh**, H. Moradi. "Enhancing the accuracy of strapdown inertial navigation systems consisting of MEMS sensors." *Aerospace knowledge and technology journal* Vol. 10, No. 2, pp. 171-188, 2022. (in Farsi)
- L. Esmaeilani, J. Ghaisari, **M.A. Bagherzadeh**, "Hammerstein–Wiener identification of industrial plants: A pressure control valve case study." *IET Control Theory & Applications*. Vol. 15 No. 3 pp 416-431, 2021.
- L. Esmaeilani, J. Ghaisari, and **M.A. Bagherzadeh**, "Bayesian approach to identify Hammerstein–Wiener nonlinear model in presence of noise and disturbance." *IET Control Theory & Applications* Vol. 13 No. 3 pp 367-376, 2019.
- **M.A. Bagherzadeh**, J. Ghaisari, J. Askari, and M. Mojiri, "Robust Asymptotic Stability of Parameterized Switched Linear Systems with Dwell Time," *IET Control Theory & Applications*, Vol. 12, No. 4, 12 Dec 2018, p. 477 – 483.
- **M. A. Bagherzadeh**, J. Ghaisari, and J. Askari; "Robust Exponential Stability and Stabilization of Parametric Uncertain Switched Linear Systems under Arbitrary Switching," *IET Control Theory & Applications*, Vol. 10, No. 4, 26 February 2016, p. 381 – 390.
- **M.A. Bagherzadeh**, J. Ghaisari, J. Askari, and M. Mojiri, "Robust Stabilization of Switched Linear Systems, Based on State Feedback Observer and Dwell Time Switching Signal," *Journal of Control*, Vol. 8, No. 4, 10 Mar 2015, p. 55 – 64. (in Farsi)
- **M.A. Bagherzadeh,** J. Ghaisari, and J. Askari; "Exponential Stability of Uncertain Switched Linear Systems," *IJST, Transactions of Electrical Engineering*, Vol. 39, No. E1, pp 79-91, 2015.

Conference Papers

- A. Hasanabadi, **M.A. Bagherzadeh**, and E. Soleimani-Nasab. "Investigating the Use of Wireless Sensor Networks in Power Plant Environments." In the Fifth National Conference on Novel Technologies in Electrical and Computer Engineering, Sep. 2022. https://civilica.com/doc/1545501/ (In Farsi)
- S. Grouhipour, **M.A. Bagherzadeh**, E. Soleimani-Nasab, and H. Vahidi. "Automation and Monitoring of Smart Greenhouses Using Suitable Wireless Protocols," In the Fifth National Conference on Novel Technologies in Electrical and Computer Engineering, Sep. 2022. https://civilica.com/doc/1545502/ (In Farsi)
- F. Khosrojerdi, H. Kourki, and **M.A. Bagherzadeh**. "Effect of Tread Depth on the Rolling Resistance of Nanocomposite Compounds." In the sixth National Polymer Conference of Iran, November 2021. https://civilica.com/doc/1349459/ (In Farsi)
- Z. Mousavi, R. Fadaeinedjad, H. Moradi, **M.A. Bagherzadeh**, and G. Moschopoulos. "A New Configuration for Wind/Solar Water Pumping System Based on a Doubly Fed Induction Generator." In 2020 IEEE Energy Conversion Congress and Exposition, pp. 1891-1898., 2020. https://doi.org/10.1109/ECCE44975.2020.9235941
- Z. Mousavi, R. Fadaeinedjad, H. Moradi, and **M.A. Bagherzadeh**. "Control of a Wind-Solar Water Pumping System Based on a Doubly Fed Induction Generator with Two-Sided Feeding," 6'th International Conference on Energy Technology and Management, Sep. 2020. https://civilica.com/doc/1266497/ (In Farsi)
- **M.A. Bagherzadeh**, H. Moradi, and H. Kalantari. "Analysis of Technical and Economic Aspects of Smart Transportation Technology to Reduce Urban Travel Time and Fuel Consumption," 1st Conference on Education and Research of Municipalities in Kerman Province, Jan. 2020. https://civilica.com/doc/1288121/ (In Farsi)
- M. H. Shafaei, **M.A. Bagherzadeh**, and E. Soleimani-Nasab. "Intelligent Public Transportation Systems," 1st Conference on Education and Research of Municipalities in Kerman Province, Jan. 2020. https://civilica.com/doc/1288132/ (In Farsi)
- **M.A. Bagherzadeh**, J. Ghaisari, and J. Askari, "Robust Stabilization of Switched Linear Systems via Static State Feedback and Switching with Dwell Time," 24th IEEE Iranian Conference on Electrical Engineering, ICEE 2016, Iran, May 10-12, 2016. https://doi.org/10.1109/IranianCEE.2016.7585547

- **M.A. Bagherzadeh**, H. Moghadas, J. Ghaisari, and A. Bakhshai, "Variable gain adaptive controller based on sensitivity method for DC-DC boost converter," 22nd IEEE Iranian Conference on Electrical Engineering, ICEE 2014, pp. 787-792, Iran, May 20-22, 2014. https://doi.org/10.1109/IranianCEE.2014.6999643
- **M.A. Bagherzadeh**, J. Ghaisari, and S. Rahili, "A Linear Switching Control Approach for DC–DC Converters," 19th IEEE Iranian Conference on Electrical Engineering, ICEE 2011, Iran, May 17-19, 2011. https://ieeexplore.ieee.org/document/5955945

RESEARCH PROJECTS

Design and Construction of a High-Pressure Vessel for producing Polymeric Nanocomposites foams with Temperature Control up to 300 degrees Celsius and Pressure Control up to 100 Bar (2023). Department of Polymer Engineering, Graduate University of Advanced Technology, Kerman, Iran.

- **Position:** Co-Principal Investigator

Causal Loop Diagram Modelling of Waste Management System in Kerman, and a Fuzzy Logic Advisor Design for the Decision-Making Situations (2023), Institute of Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.

- **Position:** Co-Principal Investigator

Dynamic Modelling of the Healthcare System in Kerman City with a Focus on Neonatal Mortality (Less than 28 Days) and Investigation of Various Scenarios for Improving the Current Situation (2023), Department of Management and Medical Informatics, Kerman University of Medical Sciences, Kerman, Iran.

- **Position:** Co-Principal Investigator

Design and implementation of a Portable Pendulum Rolling Resistant Test Device for Estimating the Properties of Elastomeric Nanocomposites. (2021-2022), Barez Industrial Group, Kerman, Iran.

- **Position:** Principal Investigator

Design and implementation of a Sensorless Coaxial Cylinders with Double Gap Viscometer for Estimating the Properties of Nano-suspensions. (2020-2021), Department of Polymer Engineering, Graduate University of Advanced Technology, Kerman, Iran.

- **Position:** Co-Principal Investigator

Design and Construction of a 100-ton Hot Press with Temperature Control up to 300 degrees Celsius. (2020-2021), Department of Polymer Engineering, Graduate University of Advanced Technology, Kerman, Iran.

- **Position:** Co-Principal Investigator

Assessment of the Existing Temperature and Humidity Control System in Greenhouses at Graduate University of Advanced Technology: Identifying Detailed Malfunctions, Required Remediations, and Cost Estimation. (2021), the Institute of Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.

- **Position:** Principal Investigator

Investigation and feasibility study of using the drive motor for controlling the torque and speed of the motors in the limestone baking section. (2019- 2020) Mobarakeh Steel Co., Isfahan, Iran.

- **Position:** Co-Principal Investigator

Design, and Implementation of a New Control Method, Automation, and Monitoring System for Steel Leveller System in Heavy Gauge of Hot Rolling Mill, (2017- 2018) Mobarakeh Steel Co., Isfahan, Iran.

- **Position:** Co-Principal Investigator

Review and Validation of Technical Documentation (Developed by MAPNA Group) for Electrical, Control, and Instrumentation Aspects of the 1:2 Monorail Switch in the Qom Monorail Project. (2017) Isfahan University of Technology., Isfahan, Iran.

- **Position:** Co-Principal Investigator

Detail Design of the Best Data Network to Transmit Critical Valves Positioning Feedback to the Control Room in Isfahan Power Plant Units 4 and 5 Resulting from Technical and Economic Comparison Among Different Feasible Solutions. (2012) Isfahan Power Plant Co., Isfahan, Iran.

- **Position:** Co-Principal Investigator

Proposing and Planning the Research and Technology Roadmap for Instrumentation and Automation in Esfahan Steel Company to Improve Applied Researches Based on Objectives and Master Plan. (2011- 2012) Esfahan Steel Company, Isfahan, Iran.

- **Position:** Co-Principal Investigator

Technological Analysis of Wireless Instrumentation Networks and Their Feasibility Studies in a Power Plant Along with Implementation of a WSN Prototype. (2010- 2011) Isfahan Power Plant Co., Isfahan, Iran.

- **Position:** Co-Principal Investigator

STUDENTS THESES

Supervisor

- **Design and Implementation of Real-Time Locating System, using RSS Method and ZigBee Protocol** (November 2019 – September 2022) (M.Sc. Thesis)
- **Increasing the accuracy of the fall detection algorithms by denoising including simulation** (November 2019 – October 2021) (M.Sc. Thesis)
- **Implementation of remote monitoring and information transmission system based on wireless standards** (September 2020 – February 2022) (M.Sc. Thesis)
- **Technical and Economic Evaluation of Wireless Sensor Networks in Power Plant Environments** (March 2020 – September 2022) (M.Sc. Thesis)
- **Automation and Wireless Data Transmission in Smart Greenhouse Systems Using Appropriate Protocols** (October 2021 – February 2023) (M.Sc. Thesis)
- **Designing a Secondary Controller to Improve the Accuracy and Response Speed of AC Microgrid Operation in Island Mode** (October 2021 – Present) (M.Sc. Thesis)
- **Designing and Implementing a Multi-Purpose Induction Furnace/Heater with Frequency Adjustment Capability** (December 2022 – Present) (M.Sc. Thesis)
- **Design and Implementation of a Monitoring and Control System Based on Commercial and Industrial Wireless Networks** (December 2022 – Present) (M.Sc. Thesis)

Advisor

- **Hammerstein–Wiener System Identification, Considering its Usage in Industrial Systems** (April 2016 – November 2018) (Ph.D. Thesis)
- **Design and Simulation of a Wind-solar water pumping system** (November 2018 – February 2020) (M.Sc. Thesis)
- **Estimating the rolling resistance of elastomeric nanocomposites** (November 2020 – March 2022) (M.Sc. Thesis)
- **Designing and Building a Solar Tracker Robot Considering the Shading Effect of Adjacent Panels** (January 2022 – September 2023) (M.Sc. Thesis)
- **Investigating the Influence of N234, N339, and N550 Carbon Black Fillers on the Rolling Resistance of Rubber Compounds** (December 2022 – September 2023) (M.Sc. Thesis)
- **Assessing the Quality and Performance of Polymer-Modified Bitumen through Rheological Analysis** (June 2022 – September 2023) (M.Sc. Thesis)
- **Investigating the Impact of the DC to AC Power Ratio on the Lifetime of Solar Inverters** (December 2022 – Present) (M.Sc. Thesis)
- **Evaluation of Transformer Loading Capability using a Thermal Electrical Model with Diverse Loading Strategies** (December 2022 – Present) (M.Sc. Thesis)

- **Investigating the Impact of Microstructure of Polymeric Nanocomposites Foams on Their Properties** (November 2023 – Present) (M.Sc. Thesis)

TEACHING EXPERIENCE

Graduate Courses:

- **Mechatronics**
  Islamic Azad University, Boroujen Branch, Boroujen, Iran. (2016-2017)
- **Nonlinear Control Systems**
  Islamic Azad University, Boroujen Branch, Boroujen, Iran. (2016-2017)
- **Robust Control Systems**
  Graduate University of Advanced Technology, Kerman, Iran. (2019-2022)
- **Modern Control Systems**
  Graduate University of Advanced Technology, Kerman, Iran. (2019-2023)
- **Fuzzy Control Systems**
  Graduate University of Advanced Technology, Kerman, Iran. (2020-2022)
- **Advanced Instrumentations**
  Graduate University of Advanced Technology, Kerman, Iran. (2022-2023)
- **Optimal Control systems**
  Graduate University of Advanced Technology, Kerman, Iran. (2022-2023)
- **Multivariable Control Systems**
  Graduate University of Advanced Technology, Kerman, Iran. (2023)
- **Industrial Automation**
  Graduate University of Advanced Technology, Kerman, Iran. (2023)

Undergraduate Courses:

- **Industrial Instrumentations**
  Islamic Azad University, Khomeinishahr Branch, Isfahan, Iran. (2013-2014)
- **Industrial Control Systems**
  Islamic Azad University, Boroujen Branch, Boroujen, Iran. (2016-2017)
- **Modern Control Systems**
  Islamic Azad University, Boroujen Branch, Boroujen, Iran. (2016-2017)
- **Industrial Automation**
  Isfahan University of Technology, Isfahan, Iran. (2017-2018)
- **Electrical Circuits I, II**
  Arak University of Technology, Arak, Iran. (2017-2018)
- **Fundamentals of Linear Algebra**
  Arak University of Technology, Arak, Iran. (2018)

Short-Term Courses:

- **Research Skills and Basic Guidelines for Research in Academic Databases (8 Hours)**
  Research Department of Kerman Municipality, Kerman, Iran. (2023)
- **Technical document preparation, using LaTeX (16 Hours)**
  Graduate University of Advanced Technology, Kerman, Iran. (2019)
- **Calibration of Instruments (16 Hours)**
  Zarand Iranian Steel Co., Kerman, Iran. (2019)
- **Getting to know the ISO/IEC 17025 Standard (16 Hours)**
  Zarand Coking and Tar Refining Complex, Kerman, Iran. (2020)

SKILLS

- **Expertise in Control Systems Engineering:**
  Advanced theoretical and practical knowledge in the identification, analysis, and control of dynamic systems.
- **Interdisciplinary Collaboration and Teamwork:**
  Demonstrated ability to collaborate effectively in interdisciplinary research projects.
- **Supervision and Advising:**
  Experience supervising and advising Ph.D. and Master's students in their research projects and theses.
- **Technical Proficiency:**
  Strong background in a wide range of electrical engineering techniques and methodologies.
- **Teaching and Communication:**
  Experience in teaching and conveying complex technical concepts to students.
- **Grant Writing:**
  Ability to write research grant proposals and secure funding.
- **Professional Software and Programming:**
  - MATLAB (Proficient)
  - Vensim for modeling of system dynamics (Proficient)
  - Altium Designer (Proficient)
  - STEP7 (Intermediate)
  - Labview (Intermediate)
  - MAPLE (Beginner)
  - Auto-CAD (Beginner)
  - Python (Beginner)
- **Proficient in Productivity Software:**
  - Microsoft Office (Word, Excel, PowerPoint)
  - LaTeX for technical document preparation
  - Adobe Photoshop for graphic editing
- **Design, Troubleshooting, and Repair of Electronic Circuit Boards:**
  Proficient in the comprehensive process of designing, troubleshooting, and repairing electronic circuit boards.
- **Calibration of Laboratory Equipment and Sensors**
- **Designing and implementing educational laboratory instruments:**
  - Pendulum Rolling Resistant Test Device for Estimating the Properties of Elastomeric Nanocomposites
  - Sensorless Coaxial Cylinders with Double Gap Viscometer for Estimating the Properties of Nanosuspensions
  - “DC Servomotor” and “Thermal Process” Trainers for Linear Control and Digital Control laboratories

HONORS AND AWARDS

- **Full scholarship during undergraduate studies (2003-2008)**
  Awarded by Isfahan University of Technology, funded by the Ministry of Science, Research, and Technology of Iran. Due to outstanding performance in the nationwide university entrance exam. (rank of 865 / 399321 participants)
- **Full scholarship during master’s studies (2008-2010)**
  Awarded by Isfahan University of Technology, funded by the Ministry of Science, Research, and Technology of Iran. Due to outstanding performance in the nationwide university entrance exam.
- **Full scholarship during Ph.D. studies (2010-2014)**
  Awarded by Isfahan University of Technology, funded by the Ministry of Science, Research, and Technology of Iran. Due to outstanding performance in the university entrance exam.
- **National Best Ideas Festival - Top Country Idea: (2010)**
  Recognized for presenting the top national idea on "Remote Process Control System in Healthcare" at the 8th National Best Ideas Festival.
- **National Elites Foundation - Public Service Facilities Scholarship: (2016)**
  Awarded by the National Elites Foundation of Iran for outstanding achievements during my academic studies.

ENGLISH PROFICIENCY

- **Listening** (Proficient)
- **Reading** (Proficient)
- **Writing** (Proficient)
- **Speaking** (Proficient)