



Hamedan University of Technology

Curriculum Vitae



Mahdi Khodabandeh, PhD

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Department of Electrical Engineering,
Hamedan University of Technology

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EDUCATION

Ph.D., Electrical Engineering (Control Engineering)

Department of Electrical Engineering, Iran University of Science & Technology, Tehran, Iran, 2011.
DISSERTATION: *Uncertainty Evaluation and Improvement in Evidential Reasoning Problems Using Sensor Fusion Techniques*

M.Sc., Electrical Engineering (Control Engineering)

Department of Electrical Engineering, Iran University of Science & Technology, Tehran, Iran, 2005.
DISSERTATION: *Design and Simulation of Nonlinear Model Predictive Control for Main Subsystems of Petrochemical Industries*

B.Sc., Electrical Engineering (Electronics Engineering)

Department of Electrical Engineering, Iran University of Science & Technology, Tehran, Iran, 2002.
DISSERTATION: *Design and Implementation of Dual Channel Counter-Timer with GPIB Interface*

PROFESSIONAL APPOINTMENT/EMPLOYMENT

- **Assistant Professor**, Department of Electrical Engineering, Hamedan University of Technology, Hamedan, Since 2011.
 - **Electronics & Instrumentation Circuits Designer**, (2002-2003 and Since 2015)
 - **Project Assistant**, Iran University of Science & Technology - Advanced Defense Research Center, 2008.
 - **Project Assistant**, Iran University of Science & Technology - Technology Development and High Technology Center (TDHT Center) (Ministry of Industry, Mine and Trade of Iran), 2005-2006.
 - **Project Assistant**, Iran University of Science & Technology - Amir Kabir Petrochemical Company (AKPC), 2003.
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ACADEMIC HONORS AND REWARDS

- **Distinguished Lecturer**, Department of Electrical Engineering, Hamedan University of Technology, 2013 and 2015
- **The 1st rank between the Ph.D. Graduates**, Department of Electrical Engineering, Iran University of Science & Technology, 2011.
- **The 1st rank between the Ph.D. Entrances**, Department of Electrical Engineering (Control Engineering), Iran University of Science & Technology, 2005.
- **Top B.Sc. Student**, Department of Electrical Engineering, Iran University of Science & Technology, 1999 and 2001.

GRANTS AND FELLOWSHIPS

- Scholarships, Iran Ministry of Science, Research and Technology, Hamedan University of Technology, (2007-2010)

ACADEMIC TEACHING EXPERIENCE

- **Lecturer**, Hamedan University of Technology, 2010 to Present
- **Lecturer**, Islamic Azad University, Abhar Branch, 2008 to 2012
- **Lecturer**, Islamic Azad University, Qazvin Branch, 2011
- **Lecturer**, Islamic Azad University, Bushehr Branch, 2008

COURSES TAUGHT

Undergraduate

- *Industrial Control*
- *Digital & Nonlinear Control Systems*
- *Linear Control Systems*
- *Linear Control Laboratory*
- *Neural Networks*
- *Logic Circuits (Digital Systems I)*
- *Modern Control Systems*
- *Electrical Circuits II*
- *Industrial Control Laboratory*
- *Instrumentation Laboratory*

Graduate

- *Multivariable Control Systems*
- *Adaptive Control Systems*
- *Neural Networks*
- *Estimation Theory*
- *Mechatronics I*
- *Advanced Instrumentation*

PROFESSIONAL MEMBERSHIP/AFFILIATIONS

- Member, Institute of Electrical and Electronics Engineers (IEEE)

SUPERVISOR OR ADVISOR OF GRADUATE DISSERTATIONS

M.Sc.

- **Supervisor**, “Variable Pitch Control for a Quadrotor Using Adaptive Feedback Linearization Method”, (In Progress)
- **Supervisor**, “Estimation of Outlet Oil Temperature Profile in a Distributed Solar Collector Field Using Unscented Kalman Filter”, (In Progress)
- **Supervisor**, “Adaptive Visual Servoing Control of a Quadrotor without Depth Measurement”, (In Progress)

- **Supervisor**, “Tracking Control of a Quadrotor Using Adaptive Dynamic Feedback Linearization Method”, (In Progress)
- **Supervisor**, “Distributed Adaptive Control Oil Temperature Solar Collectors on the Environment by Eliminating Disturbances”, (In Progress)
- **Supervisor**, “Design of Unfalsified Adaptive Control for Quadrotor”, 2018.
- **Supervisor**, “Thermal and Energy Management for Multi-Core Processors Using Control Techniques”, 2017.
- **Supervisor**, “Robust Adaptive Control of a Quad-rotor Considering Uncertainties”, 2016.
- **Supervisor**, “Design of a Fault Tolerant Control System for a Quad-rotor”, 2016.
- **Supervisor**, “State Estimation based Frequency Oscillation Elimination and Stability Improvement in Micro-Grids”, 2016.
- **Supervisor**, “Adaptive Voltage and Frequency Control in Islanded Micro-grids Including Distributed Generation”, 2015.
- **Supervisor**, “Path Tracking of a Quad-rotor with Disturbance Using Adaptive Control”, 2014.
- **Advisor**, “Improvement of Frequency Control Capability of Variable Speed Wind Turbines Using Energy Storage”, 2017.

B.Sc.

- **Supervisor**, 74 Theses.

HIGHLIGHTS OF PROFESSIONAL AND INDUSTRIAL EXPERIENCE

- **Electronics & Instrumentation Circuits Designer**, (2002-2003 and Since 2015)
- **Project Assistant**, “Design of an Industrial Information System for Petrochemical Industries”, Iran University of Science & Technology - Advanced Defense Research Center, 2008.
- **Project Assistant**, “Design of Predictive Control Software for Industrial Processes”, Iran University of Science & Technology - Technology Development and High Technology Center (TDHT Center), Ministry of Industry, Mine and Trade of Iran, 2005-2006.
- **Project Assistant**, “Research Project on Mine Detector Methods and Mine Detector Robots”, Iran University of Science & Technology - Amir Kabir Petrochemical Company (AKPC), 2003.

WORKSHOPS PARTICIPATION

- **Workshop**, “Implementation of Embedded Systems by Model-based Design Method Using MATLAB Software”, 14th International Conference of Iranian Aerospace Society, Iranian Research Organization for Science & Technology, 2015.
- **Workshop**, “Principles of National Standard Codification”, 2015.
- **Workshop**, “Introduction to Patent Process and Industrial Property”, 2015.

SERVICE TO PROFESSION

Journal Reviewer:

- *IEEE Transactions on Industrial Electronics (IEEE-TIE)*
- *IEEE Transactions on Systems, Man and Cybernetics (IEEE-TSMC)*
- *IEEE Access*
- *IET Biomatrix*
- *Instrumentation Science & Technology*
- *Transaction of the Institute of Measurement and Control (TIMC)*
- *Digital Signal Processing (DSP)*
- *ISA Transactions*
- *Robotica*
- *Control Engineering Practice*
- *Nonlinear Dynamics*
- *Neural Computing & Applications*
- *International Journal of Robust and Nonlinear Control*
- *Aerospace Science & Technology*

- *Journal of Aerospace Engineering*
- *JAERO (Journal of Aerospace Engineering)*
- *Advances in Mechanical Engineering*
- *Iranian Journal of Science and Technology, Transactions of Electrical Engineering*
- *Geosystem Engineering*
- *International Journal of Advanced Design and Manufacturing Technology (ADMT)*
- *Journal of Applied and Computational Mechanics (JACM)*
- *Journal of Control Engineering and Technology (JCET)*
- *Hindawi International Journal of Aerospace Engineering*
- *SCIENCE CHINA Information Sciences*
- *Journal of Control (KNTU)*
- *Amirkabir International Journal of Modeling, Identification, Simulation and Control (AIJ-MISC)*
- *Iranian Journal of Science and Technology, Transactions of Electrical Engineering*
- *Tabriz Journal of Electrical Engineering*
- *Intelligent Systems in Electrical Engineering*
- *Majlesi Journal of Electrical Engineering*

Technical Referee:

- Technical Referee in Hamedan Science and Technology Park, Since 2012

DEPARTMENTAL/UNIVERSITY SERVICE

- Member of Supervision and Evaluation Council, Hamedan University of Technology
- Member of Strategic Planning Committee, Hamedan University of Technology
- Member of Student Primitive Disciplinary Committee, Hamedan University of Technology
- Vice-Head of Department of Electrical Engineering, Hamedan University of Technology, (2012-2013)
- Member of Internal Evaluation Committee, Department of Electrical Engineering, Hamedan University of Technology

FIELDS OF INTEREST AND SKILLS

Fields of Interest:

- *Sensor and Data Fusion*
- *Information Theory*
- *Adaptive Control*
- *Industrial Control & Automation*
- *Instrumentation*
- *Predictive Control (Linear & Nonlinear)*
- *Robotics*

LANGUAGES

- Persian (Native)
- English (Fluent)

PUBLICATIONS

Journal Papers:

1. A.M. Shahri and M. Khodabandeh, "Generalized Aggregate Uncertainty Measure 2 for Uncertainty Evaluation of a Dezert-Smarandache Theory based Localization Problem", *Amirkabir International Journal of Modeling, Identification, Simulation & Control (AIJ-MISC)*, Volume 49, Issue 2, Summer & Autumn 2017, PP: 21-30, DOI:10.22060/miscj.2016.826.

2. A.M. Shahri and **M. Khodabandeh**, "Uncertainty Measurement for Ultrasonic Sensor Fusion Using Generalized Aggregated Uncertainty Measure 1", *Amirkabir International Journal of Modeling, Identification, Simulation & Control (AIJ-MISC)*, Volume 49, Issue 1, Winter & Spring 2017, PP: 85-94, 10.22060/miscj.2016.827.
3. M. Vahdanipour and **M. Khodabandeh**, "*Back-stepping based Sliding Mode Control for a Quadrotor with Payload Disturbance Elimination and Moment of Inertia Estimation Using Adaptive Methods*", *Tabriz Journal of Electrical Engineering*, Serial Number 80, Vol. 47, Issue. 2, Summer 2017, pp. 775-783. (In Persian)
4. A. Modirrousta and **M. Khodabandeh**, "Adaptive Robust Free Sliding Mode Controller Design for Full Control of a Quadrotor with External Disturbances", *Transactions of the Institute of Measurement and Control (TIMC)*, Vol. 39, Issue 3, March 2017, PP: 371-383, (DOI: 10.1177/0142331215611210)
5. M. Karamali and **M. Khodabandeh**, "*A Distributed Solar Collector Field Temperature Profile Control and Estimation Using Inlet Oil Temperature and Radiation Estimates based on Iterative Extended Kalman Filter*", *Renewable Energy*, Vol. 101, February 2017, PP: 144-155, (DOI: 10.1016/j.renene.2016.08.049).
6. M. Tabatabaei Mavahebi, **M. Khodabandeh** and A. Seif, "Hybrid Predictive Control Based on PWA Model for a pH Neutralization Process with Considering Buffer Flow Variations", Vol. 35, Issue 3, Serial Number 81, Summer 2016, pp. 127-135, (In Persian).
7. A. Modirrousta and **M. Khodabandeh**, "*A Novel Adaptive Free Chattering Sliding Mode Control for a Quadrotor*", *Aerospace Science and Technology (AESCTE)*, Vol. 45, September 2015, pp. 294-308, (DOI: 10.1016/j.ast.2015.05.022)
8. A. Modirrousta and **M. Khodabandeh**, "*Design of an Adaptive Integral Sliding Mode Control for Robust and Finite Time Stabilization for a Quadrotor*", *Tabriz Journal of Electrical Engineering*, Serial Number 75, Vol. 46 Issue 1, Spring 2016 , pp. 321-332 (In Persian).
9. T. Salehi, M. Shokrian, A. Modirrousta, **M. Khodabandeh**, M. Heidari, "*Estimation of the Collapse Potential of Loess Soils in Golestan Province using Neural Networks and Neuro-Fuzzy Systems*", *Arabian Journal of Geosciences*, Vol. 8, Issue 11, pp. 9557-9567, November, 2015, (DOI: 10.1007/s12517-015-1894-4).
10. A. Modirrousta and **M. Khodabandeh**, "*Adaptive Second Order Terminal Backstepping Sliding Mode for Attitude Control of Quadrotor Flying Robot with External Disturbances*", *Majlesi Journal of Electrical Engineering*, (MJEE), Vol. 9, No. 2, pp. 51-58, June 2015.
11. **M. Khodabandeh**, Alireza Mohammad-Shahri, "*Uncertainty Evaluation for an Ultrasonic Data Fusion based Target Differentiation Problem Using Generalized Aggregated Uncertainty Measure*", *Measurement*, Vol. 59, January 2015, pp. 139-144 (DOI: 10.1016/j.measurement.2014.09.036).
12. **M. Khodabandeh**, A. M. Shahri, "Uncertainty Evaluation for a Dezert-Smarandache Theory based Localization Problem", *International Journal of General Systems (IJGS)*, Vol. 43, Issue 6, pp. 610-632, 2014, DOI:10.1080/03081079.2014.896353.
13. **M. Khodabandeh**, A. M. Shahri, "*Two Generalizations of Aggregated Uncertainty Measure for Evaluation of Dezert-Smarandache Theory*", *International Journal of Information Technology & Decision Making (IJITDM)*, Vol. 11, No. 1, pp. 119-142, 2012.
14. M. Miranbeigi, **M. Khodabandeh**, F. Yousefi, R. Miranbeigi, "*Advanced Process Controllers in Petrochemical Industries Automation*", *Instrumentation (Abzar Daghigh)*, No. 27, PP: 28-29, 2010, (In Persian).
15. N. Denashpour, **M. Khodabandeh**, M. R. Jahed-Motlagh, J. Poshtan, "*Survey on Model Predictive Control Technologies: Benefits, Applications and Implementation Considerations*", *Intelligent Industry (Sana't Hooshmand)*, No. 70, PP: 42-48, 2006, (In Persian).

Conference Proceedings:

1. M. Mosalsal and **M. Khodabandeh**, "Design of Feedback Linearization Control for a Variable Pitch Quadrotor", *3rd International Conference on Electrical Engineering*, Tehran, Iran, September 7, 2018. (In Persian).
2. A. Hokmabadi and **M. Khodabandeh**, "Unfalsified Control Design for a Quadrotor", *5th Conference on Electrical Engineering and Computer with Emphasis on Native Knowledge*, Tehran, Iran, February 8, 2018, (In Persian).
3. O. Niroomandi and **M. Khodabandeh**, "Power consumption modeling in multiprocessor systems", *The 2nd National Conference on New Approaches in Electrical and Computer Engineering*, Basir Institute of High Education, Tehran, Iran, October 20, 2017, (In Persian).
4. A. Azizkhani and **M. Khodabandeh**, "Design and Combination of Feedback Linearization and Adaptive Sliding Mode control for a Quadrature in the Face of External Disturbances", *2nd International Conference on Electrical Engineering*, Tehran, Iran, September 14, 2017. (In Persian).
5. N. Maleki and **M. Khodabandeh**, "Control of Outlet Oil Temperature in Parabolic Trough Solar Power Plant Collector Field Using Sliding Mode Controller", *2nd International Conference on Electrical Engineering*, Tehran, Iran, September 14, 2017. (In Persian).
6. M. Karamali and **M. Khodabandeh**, "Temperature Profile and Inlet Oil Temperature Estimates in Control Design of Outlet Oil Temperature of Shiraz Solar Power Plant Using Extended Kalman Filter", *The 1st International Conference on Electrical Engineering*, Tehran University, Tehran, Iran, June 1, 2016, Paper code: ee2016-04910317, (In Persian).

7. F. Kordi and **M. Khodabandeh**, "Model Predictive Control of a Quadrotor", *The 1st National Conference on New Approaches in Electrical and Computer Engineering, Islamic Azad University, Khorramabad branch, Khorramabad, Iran, May 20, 2016. (In Persian)*
8. N. Nasrollahi and **M. Khodabandeh**, "Fault Tolerant Model Predictive Controller for Wind Turbine", *The 1st National Conference on New Approaches in Electrical and Computer Engineering, Islamic Azad University, Khorramabad branch, Khorramabad, Iran, May 20, 2016. (In Persian)*
9. M. R. Mohammadkhani, M. Vahdanipour and **M. Khodabandeh**, "Fault Tolerant Control of a Quadrotor Using Adaptive Sliding Mode Control in Presence of Actuators' Faults", *The 3rd National and the 1st International Conference on Applied Researches in Electrical, Mechanical and Mechatronics Engineering, Malek-e-Ashtar University of Technology and University of Applied Science and Technology, Tehran, Iran, 18 February 2016. (In Persian)*
10. M. Vahdanipour, M. R. Mohammadkhani and **M. Khodabandeh**, "Back-Stepping based Adaptive Sliding Mode Control of a Quadrotor with considering Uncertain Payloads", *The 3rd National and the 1st International Conference on Applied Researches in Electrical, Mechanical and Mechatronics Engineering, Malek-e-Ashtar University of Technology and University of Applied Science and Technology, Tehran, Iran, 18 February 2016. (In Persian)*
11. A. Adami and **M. Khodabandeh**, "Fuzzy Gain Scheduling Control for a Distributed Parabolic solar Collector Field", *The 4th International Conference on Control, Instrumentation and Automation, Qazvin Islamic Azad University, Qazvin, Iran, January 26-27, 2016. (In Persian)*
12. M. Attar and **M. Khodabandeh**, "Hybrid Modeling and Explicit Model Predictive Controller For a DC-DC Converter", *Seminar on Power Electronics Technologies (TPES 2015), Sharif University of Technology, Tehran, Iran, 3-4 March 2015. (In Persian).*
13. M. Tabatabaei Mavahebi, **M. Khodabandeh** and A. Seif, "Hybrid Predictive Control based on PWA Model for pH Neutralization Process", *the 15th Iranian National Congress of Chemical Engineering, University of Tehran, Tehran, Iran, 17-19 February 2015, (In Persian).*
14. A. Modirrousta, **M. Khodabandeh**, "Adaptive Robust Sliding Mode Controller Design for Full Control of Quadrotor with External Disturbances", *2nd RSI/ISM International Conference on Robotics and Mechatronics (ICRoM 2014), K. N. Toosi University of Technology – Tehran-Iran, October 15-17, 2014. pp. 870-877. DOI: [10.1109/ICRoM.2014.6991014](https://doi.org/10.1109/ICRoM.2014.6991014).*
15. A. Modirrousta, **M. Khodabandeh**, "Adaptive Terminal Backstepping Sliding Mode for Attitude Control of Quadrotor Flying Robot with External Disturbances", *6th Iranian Conference on Electrical & Electronics Engineering (ICEEE2014), Islamic Azad University, Gonabad Branch, August 19-21, 2014, pp. 1999-2006.*
16. **M. Khodabandeh**, A. M. Shahri, "Uncertainty Measurement based Supervision in a Hierarchical Decision Making Problem", *In proceeding of 1st International Symposium on Computing in Science & Engineering (ISCSE2010), Gediz University, Kusadasi, Turkey, pp.526-531, 3-5 June 2010.*
17. **M. Khodabandeh**, A. M. Shahri, "Data Fusion of Cameras' Images for Localization of an Object; DSMT-based Approach", *1st International Symposium on Computing in Science & Engineering (ISCSE2010), Gediz University, Kusadasi, Turkey, pp. 479-485, 3-5 June 2010.*
18. **M. Khodabandeh**, A. M. Shahri, "Uncertainty Evaluation for Ultrasonic Sensor Fusion Results in Object Detection Problems", *1st International Conference on Control, Instrumentation & Automation, (ICCIA 2010), Tarbiat Modarres University, Tehran, Iran, 2010, (In Persian).*
19. **M. Khodabandeh**, A. M. Shahri, "Experimental Study of Uncertainty Measures with Sensor Fusion Techniques", *2010 2nd International Asia Conference on Informatics in Control, Automation and Robotics, Wuhan, China, pp. 151-154, 13-15 March 2010.*
20. M. Miranbeigi, **M. Khodabandeh**, "Advanced Process Controllers in Petrochemical Industries Automation", *Iran's 2nd International Conference on Industrial Automation, Sharif University of technology, 2009, (In Persian).*
21. **M. Khodabandeh**, M. Analoui, A. M. Shahri, "Target Differentiation Using Sonar Data for Robot Applications; Neural Network and Bayesian Approaches", *International Conference on Control, Automation and Systems, COEX (Convention & Exhibition Center), Seoul, KOREA, pp. 1958-1961, October 17-20, 2007.*
22. **M. Khodabandeh**, H. Bolandi, "Model Predictive Control with State Estimation and Adaptation Mechanism for a Continuous Stirred Tank Reactor", *International Conference on Control, Automation and Systems, COEX (Convention & Exhibition Center), Seoul, KOREA, pp. 1466-1471, October 17-20, 2007.*
23. H. Bolandi, **M. Khodabandeh**, "Nonlinear Model Predictive Control with Consideration of Measurable Disturbances for a Continuous Stirred Tank Reactor, 13th Iranian Conference on Electrical Engineering (ICEE 2005), Zanzan University, Zanzan, Iran, 2005, (In Persian).
24. H. Bolandi, **M. Khodabandeh**, S. Bahmanpour, "Design of an Adaptive Predictive Controller for a Continuous Stirred Tank Reactor", *7th WSEAS (World Scientific & Engineering Academy & Society) International Conference on Automatic Control, Modeling and Simulation (ACMOS), Prague, Czech Republic, pp. 334-340, March 13-15, 2005.*

25. B. Sadeghi Frouz and **M. Khodabandeh**, "Control and Tracking of Cooperative Quadrotors using PID Controllers", *The 1st National Student Conference on Aerospace, Department of Aerospace Engineering, Amir Kabir University of Technology, Tehran, Iran, October 6, 2015.*
26. A. Modirrousta, **M. Khodabandeh**, "Finite Time Stabilizing of a Quadrotor using Robust Integral Sliding Mode Control", *8th Students Conference on Mechanical Engineering, University of Guilan, Rasht, 8-10 October 2014.(In Persian)*
27. M. Shojaei, **M. Khodabandeh**, "Generalized Predictive Control for a Stirred Tank Reactor", *15th Iranian Student Conference on Electrical Engineering (ISCEE 2012), Kashan University, Kashan, Iran, 2012.(In Persian)*
28. A. Hokmabadi, S. N. Mosaddeghi, **M. Khodabandeh**, "Ultrasonic Sensor Fusion Using Neural Network for Target Differentiation", *15th Iranian Student Conference on Electrical Engineering (ISCEE 2012),Kashan University, Kashan, Iran, 2012.(In Persian)*