Department of Electrical Engineering K. N. Toosi University of Technology Postal address: Seyyed Khandan Bridge, Shariati Street, P.O. Box 16315-1355., Tehran, Iran

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#### SPECIALIZED EXPERIENCE

# K.N. Toosi University of Technology, Tehran, Iran, 2017-now Assistant Professor:

- Start-up project to establish Petroleum Industry Productivity Research Center (PIPRC)
- In charge of teaching and conducting applied research in the areas of: 1) Energy, oil ,gas and process control applications, 2) Economics of Energy, 3) Energy Markets (optimization, bidding and offering strategies), 4) Optimal Control, 5) Dynamic Game Theory, 6) Prediction and decision-making in multi-agent interactive systems, 7) Data-driven techniques (such as neural network, fuzzy logic, and evolutionary algorithms).

# Norwegian University of Science and Technology, Trondheim, Norway, 2012-2016 *Researcher:*

- Designed a Nonlinear Moving Horizon Observer for estimation of states and parameters in Under-Balanced Drilling (UBD) operations
- Developed an adaptive observer for Reservoir characterization in UBD Operations
- Developed a Model predictive control (MPC) for heave disturbance attenuation in offshore Managed Pressure drilling systems
- Reservoir characterization in Under-balanced Drilling using Low-Order Lumped Model.
- State and Parameter Estimation of a Drift-Flux Model for UBD Operations.
- Collaborate and Supervised some PhD and master students
- Published several papers in peer reviewed journals and conferences

## Arad Aluminum Construction Engineering, Tehran, Iran, 2011-2012

**Automation Engineer:** Retrofitting of feeding system of aluminum electrolysis cell (point feeding system), Almahdi Aluminium Complex, Bandar Abbas, Iran

Scope of this project included upgrading of a center feed reduction cell by redesign of feeding mechanism. Our project was primarily a research ordered by Almahdi Aluminum Corp. This project was selected as the best research project of the year by IMIDRO (Iranian Mines and Mining Industries Development and Renovation Organization).

Responsible for designing and improving multi-level automation system for aluminum pots of Almahdi Aluminum Corp.

### Iran-Khodro Company, Tehran, Iran, June 2007-September 2007

**Electrical Engineering Intern:** CEC (Central Electronic Controller) project of Peugeot 405 for IranKhodro Company

The project was to combine 7 different electric parts of Peugeot 405 and designing a single electronic board. I was responsible for designing Central Electric Controller (CEC) for Peugeot 405 family cars and integrating 7 circuit devices and designed a single electrical board.

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1. PhD Electrical (Control), Norwegian University of Science and Technology - Norway, 2012-2016

- 2. MSc Electrical (Control), University of Tehran- Tehran, Iran, 2008-2011
- 3. BSc Electrical (Control) Engineering, University of Tehran- Tehran, Iran, 2004-2008

## **JOURNALS:**

- 1. Safiri, S., Nikoofard, A., Khosravy, M., & Senjyu, T. (2022). Multi-agent Distributed Reinforcement Learning Algorithm for Free-model Economic-environmental Power and CHP Dispatch Problems. IEEE Transactions on Power Systems.
- 2. Gougheri, S. S., Dehghani, M., Nikoofard, A., Jahangir, H., & Golkar, M. A. (2022). Economic assessment of multi-operator virtual power plants in electricity market: A game theory-based approach. Sustainable Energy Technologies and Assessments, 53, 102733.
- 3. Sheikhi, M. A., Nikoofard, A., & Khaki-Sedigh, A. (2022). Control of managed pressure drilling systems using nonlinear predictive generalized minimum variance approach based on a Volterra model. ISA transactions, 128, 380-390.
- 4. Safiri, S., & Nikoofard, A. (2022). Ladybug Beetle Optimization algorithm: application for real-world problems. The Journal of Supercomputing, 1-50.
- 5. Gorjizadeh, H., Ghalehnoie, M., Negahban, S., & Nikoofard, A. (2022). Fuzzy controller design for constant bottomhole pressure drilling under operational/physical constraints. Journal of Petroleum Science and Engineering, 212, 110335.
- 6. Mirtaba, M., Jeddi, M., Nikoofard, A., & Shirmohammadi, Z. (2022). Design and implementation of a low-complexity flight controller for a quadrotor UAV. International Journal of Dynamics and Control, 1-12.
- 7. Mirbarati, S. H., Heidari, N., Nikoofard, A., Danish, M. S. S., & Khosravy, M. (2022). Techno-Economic-Environmental Energy Management of a Micro-Grid: A Mixed-Integer Linear Programming Approach. Sustainability, 14(22), 15036.
- 8. Faghiri, M., Samizadeh, S., Nikoofard, A., Khosravy, M., & Senjyu, T. (2022). Mixed-integer linear programming for decentralized multi-carrier optimal energy management of a micro-grid. Applied Sciences, 12(7), 3262.
- 9. Jalalzad, S. H., Yektamoghadam, H., Haghighi, R., Dehghani, M., Nikoofard, A., Khosravy, M., & Senjyu, T. (2022). A Game Theory Approach Using the TLBO Algorithm for Generation Expansion Planning by Applying Carbon Curtailment Policy. Energies, 15(3), 1172.
- 10. Nejabat, E., & Nikoofard, A. (2022). Hybrid Robust Model Predictive Based Controller for a Class of Multi-Agent Aerial dynamic Systems. AUT Journal of Electrical Engineering, 54(2), 209-224.
- 11. Naderi, N., Nasersharif, B., & Nikoofard, A. (2022). Persian speech synthesis using enhanced tacotron based on multi-resolution convolution layers and a convex optimization method. Multimedia Tools and Applications, 1-17.
- 12. Sheikhoushaghi, A., Gharaei, N. Y., & Nikoofard, A. (2022). Application of Rough Neural Network to forecast oil production rate of an oil field in a comparative study. Journal of Petroleum Science and Engineering, 109935.
- 13. Badfar, E., Zaferani, E. J., & Nikoofard, A. (2022). Design a robust sliding mode controller based on the state and parameter estimation for the nonlinear epidemiological model of Covid-19. Nonlinear Dynamics, 1-14.

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- 14. Gozalpour, N., Badfar, E., & Nikoofard, A. (2021). Transmission dynamics of novel coronavirus SARS-CoV-2 among healthcare workers, a case study in Iran. Nonlinear Dynamics, 105(4), 3749-3761.
- 15. Solgi, Y., Fatehi, A., Nikoofard, A., & Shariati, A. (2021). Design of optimal PID controller for multivariable time-varying delay discrete-time systems using non-monotonic Lyapunov-Krasovskii approach. Journal of the Franklin Institute, 358(13), 6634-6665.
- 16. Sadeghimehr, R., Nikoofard, A., & Khaki Sedigh, A. (2021). Predictive-based sliding mode control for mitigating torsional vibration of drill string in the presence of input delay and external disturbance. Journal of Vibration and Control, 27(21-22), 2432-2450.
- 17. Sheikhi, M. A., Khaki-Sedigh, A., & Nikoofard, A. (2021). Design of nonlinear predictive generalized minimum variance control for performance monitoring of nonlinear control systems. Journal of Process Control, 106, 54-71.
- 18. Mahbuby, H., Amerian, Y., Nikoofard, A., & Eshagh, M. (2021). Application of the nonlinear optimisation in regional gravity field modelling using spherical radial base functions. Studia Geophysica et Geodaetica, 65(3), 261-290.
- 19. Haghighi R, Yektamoghadam H, Dehghani M, Nikoofard A. Generation expansion planning using game theory approach to reduce carbon emission: A case study of Iran. Computers & Industrial Engineering. 2021 Dec 1;162:107713.
- 20. Dehghani, M., Taghipour, M., Sadeghi Gougheri, S., Nikoofard, A., Gharehpetian, G. B., & Khosravy, M. (2021). A Deep Learning-Based Approach for Generation Expansion Planning Considering Power Plants Lifetime. Energies, 14(23), 8035.
- 21. Golzari Hormozi, A., Khasteh, S., Nikoofard, A., Shirmohammadi, Z. (2021). ForSts: Tacit Collusion in the Repeated Non-Cooperative Games Using Forwarding N-Steps Reinforcement Learning Algorithm. Computational Intelligence in Electrical Engineering, 12(4), 1-12
- 22. Yektamoghadam, H., & Nikoofard, A. (2021). Fault Detection in Thermoelectric Energy Harvesting of Human Body. Journal of Electrical and Computer Engineering Innovations (JECEI), 9(1), 57-66.
- 23. Jafari, A., Shahbazian, A., Fereidunian, A., Nikoofard, A. (2020). Improving self-healing of smart distribution network by allocating switches and distributed generation resources using soft computing. Computational Intelligence in Electrical Engineering, 11(2), 1-16.
- 24. Nikoofard, A., Johansen, T. A., & Molaei, A. (2020). Reservoir characterization in under-balanced drilling with nonlinear moving horizon estimation with manual and automatic control conditions. Journal of Petroleum Science and Engineering, 192, 107248.
- 25. M.Nozarian, A.Nikoofard, and Alireza Fereidunian. "Efficient MILP formulations for AC optimal power flow to reduce computational effort." International Transactions on Electrical Energy Systems 30.8 (2020): e12434.
- 26. Doshmanziari, R., Khaloozadeh, H., & Nikoofard, A. (2020). Gas pipeline leakage detection based on sensor fusion under model-based fault detection framework. Journal of Petroleum Science and Engineering, 184, 106581.
- 27. Shirmohammadi, Z., Nikoofard, A., & Ershadi, G. (2019). AM3D: an accurate crosstalk probability modeling to predict channel delay in 3D ICs. Microelectronics reliability, 102, 113379.

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28. Nikoofard, A., Johansen, T. A., & Kaasa, G. O. (2018). Reservoir characterization in underbalanced drilling using low-order lumped model. Journal of Process Control, 62, 24-36.

- 29. A. Nikoofard, U. J. Flø Aarsnes, T. A. Johansen, G.-O. Kaasa, States and Parameter Estimation of a Drift-Flux Model for Under-Balanced Drilling Operations, IEEE Transaction on Control Systems Technology, vol 25,no.6, pp.2000-2009, November 2017
- 30. A. Nikoofard, T.A. Johansen, H. Mahdianfar, A. Pavlov, "Design and comparison of constrained MPC with PID controller for heave disturbance attenuation in offshore managed pressure drilling systems," Marine Technology Society Journal, Vol 48, no.2, pp.90-13, March 2014
- 31. A. Nikoofard, H. Hajimirsadeghi, A. Rahimi-Kian, C. Lucas, "Multi-objective Invasive Weed Optimization: Analysis of Pareto Improvement Models in Electricity Markets," Applied soft computing, Vol 12, no.1, pp. 100-112, Jan 2012

#### **CONFERENCE PROCEEDING:**

- 1. Samizadeh, S., Nikoofard, A., & Yektamoghadam, H. (2022, March). Decision Making for Autonomous Vehicles' Strategy in Triple-Lane Roundabout Intersections. In 2022 8th International Conference on Control, Instrumentation and Automation (ICCIA) (pp. 1-6). IEEE.
- 2. Hajyan, M., & Nikoofard, A. (2022, March). Fuzzy Control of Autonomous Vehicle at Non-signalized Intersection in Mixed Traffic Flow. In 2022 9th Iranian Joint Congress on Fuzzy and Intelligent Systems (CFIS) (pp. 1-6). IEEE.
- 3. Kalantari, M. M., Yektamoghadam, H., & Nikoofard, A. (2022, March). A Fault Isolation Approach for Data-Driven Device Replacement Decision Making. In 2022 9th Iranian Joint Congress on Fuzzy and Intelligent Systems (CFIS) (pp. 1-6). IEEE.
- 4. Armoon, M., Lafouti, M., & Nikoofard, A. (2022, March). Intelligent fault detection of planetary gearbox using vibration signal processing by empirical mode decomposition and an integrated artificial neural network-support vector machine classifier. In 2022 9th Iranian Joint Congress on Fuzzy and Intelligent Systems (CFIS) (pp. 1-6). IEEE.
- 5. Soleimani, E., Nikoofard, A., & Yektamoghadam, H. (2021, November). Multiagent UAVs Routing in Distributed vs Decentralized models: Game theory approach. In 2021 9th RSI International Conference on Robotics and Mechatronics (ICROM) (pp. 316-321). IEEE.
- 6. Sheykhha, M. R., Dehghani, M., Fereidunian, A., & Nikoofard, A. (2021, August). A Game-Theoretic Model for Retail Electricity Market Using Adaptive Expectations Learning. In 2021 25th Electrical Power Distribution Conference (EPDC) (pp. 36-41). IEEE.
- Nejabat, E., & Nikoofard, A. (2021, May). Switched Robust Model Predictive Based Controller for UAV Swarm System. In 2021 29th Iranian Conference on Electrical Engineering (ICEE) (pp. 721-725). IEEE.
- 8. Olanlari, Farzin Ghasemi, Saleh Sadeghi Gougheri, and Amirhossein Nikoofard. "A Multi-Objective Generation Expansion Planning with Modeling Load Demand Uncertainty by a Deep Learning-Based Approach." 2020 10th Smart Grid Conference (SGC). IEEE, 2020.
- 9. Tousi, S. M. A., Khorramdel, J., Lotfi, F., Nikoofard, A. H., Ardekani, A. N., & Taghirad, H. D. (2020, September). A New Approach To Estimate Depth Of Cars Using A Monocular Image. In 2020 8th Iranian Joint Congress on Fuzzy and intelligent Systems (CFIS) (pp. 045-050). IEEE.

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10. Molaei, A. M., Nikoofard, A. H., Khaki-Sedigh, A., & Imsland, L. (2020, May). Managed Pressure Drilling System State Estimation Using The Multiple Model Adaptive Estimation Approach. In 2020 European Control Conference (ECC) (pp. 985-990). IEEE.

- 11. Yektamoghadam, H., Lafouti, M., & Nikoofard, A. (2020, August). Optimal perimeter control for Three Urban Regions. In 2020 28th Iranian Conference on Electrical Engineering (ICEE) (pp. 1-6). IEEE.
- 12. Mohammadikia, R., Nikoofard, A., & Tavakoli-Kakhki, M. (2020, August). Application of MPC for an Automatic Voltage Regulator and Load Frequency Control of Interconnected Power System. In 2020 28th Iranian Conference on Electrical Engineering (ICEE) (pp. 1-5). IEEE.
- 13. Moradi-Sepahvand, M., Amraee, T., & Nikoofard, A. (2019, December). A Game Framework to Confront Targeted Physical Attacks Considering Optimal Placement of Energy Storage. In 2019 Smart Grid Conference (SGC) (pp. 1-6). IEEE.
- 14. Mehr, R. S., Nikoofard, A., & Sedigh, A. K. (2019, October). Smith Predictor Based Sliding Mode Control for Torsional Vibration Control of Drillstring with Input Delay. In 2019 6th International Conference on Control, Instrumentation and Automation (ICCIA) (pp. 1-6). IEEE.
- 15. Doshmanziari, R., Khaloozadeh, H., & Nikoofard, A. (2019, October). Unscented Kalman Filter in Gas pipeline leakage magnitude estimation and localization. In 2019 6th International Conference on Control, Instrumentation and Automation (ICCIA) (pp. 1-6). IEEE.
- 16. Abolghasemi, M., Gozalpour, N., Nikoofard, A., & Ghasemi, A. (2019, April). Interdependent Network Formation Game Using TLBO Algorithm. In 2019 27th Iranian Conference on Electrical Engineering (ICEE) (pp. 1935-1939). IEEE.
- 17. Osooli, H., Nikoofard, A., & Shirmohammadi, Z. (2019, April). Game Theory for Eye Robot Movement: Approach and Hardware Implementation. In 2019 27th Iranian Conference on Electrical Engineering (ICEE) (pp. 1081-1085). IEEE.
- 18. Vafamand, A., & Nikoofard, A. (2018, November). Multi-objective optimal strategies for HIV drug dosage scheduling using NSIWO. In 2018 25th National and 3rd International Iranian Conference on Biomedical Engineering (ICBME) (pp. 1-5). IEEE.
- 19. Jahanbakhshi, S., Khaloozadeh, H., & Nikoofard, A. (2018, May). Tacit collusion in pool-based electricity markets with a demand shock. In Electrical Engineering (ICEE), Iranian Conference on (pp. 1197-1202). IEEE.
- A.Nikoofard, T. A. Johansen, G.-O. Kaasa, Evaluation of Lyapunov-based Adaptive Observer using Low-Order Lumped Model for Estimation of Production Index in Under-balanced Drilling, 9th International Conference on Advanced Control of Chemical Processes (ADCHEM), pp. 69-75, Whistler, Canada, 2015
- 21. A. Nikoofard, U. J. Flø Aarsnes, T. A. Johansen, G.-O. Kaasa, Estimation of States and Parameters of Drift-Flux Model with Unscented Kalman Filter, 2nd IFAC Workshop on Automatic Control in Offshore Oil and Gas Production, pp. 171-176, Florianópolis, Brazil, 2015
- 22. A. Nikoofard, T.A. Johansen, G.-O.Kaasa, Nonlinear moving horizon observer for estimation of states and parameters in under-balanced drilling operations, Proceeding of the ASME Dynamic Systems and Control Conference (DSCC 2014), San Antonio, TX, October 2014

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23. A. Nikoofard, T.A. Johansen, G.-O.Kaasa, Design and comparison of adaptive estimators for under-balanced drilling, Proceeding of the American Control Conference (ACC2014), pp.5681-5687, June2014

- 24. A. Nikoofard, T.A. Johansen, H. Mahdianfar, A. Pavlov, Constrained MPC Design for Heave Disturbance Attenuation in Offshore Drilling Systems, IEEE/MTS OCEANS, Bergen,pp.1-7, June2013
- 25. A.Nikoofard, F.R.Salmasi, A.Khaki Sedigh, "An Adaptive Observer for Linear Systems with Reduced Adaptation Laws and Measurement Faults", Proceedings of the 23th Chinese Control and Decision Conference (CCDC 2011), pp. 1105-1109, May 2011
- 26. A.Bakhtiari, A.Nikoofard and C.Lucas," Predicting the need of cancer drugs to be produced before patient need, using OWA", Proceedings of the 17th Iranian Conference on Biomedical Engineering, November 2010.
- 27. Z.Faraji-Dana, A.Nikoofard," using OWA method for choosing the best cell phone", Proceeding of the 3rd joint congress on Fuzzy and Intelligent Systems, Yazd, Iran, 6 pages, July 2009.
- 28. A.Nikoofard, Z.Faraji-Dana," using OWA method in K-Nearest neighbor algorithm ", Proceeding of the 3rd joint congress on Fuzzy and Intelligent Systems, Yazd, Iran, 5 pages, July 2009.

### **PROFESSIONAL SUMMARY**

My fields of expertise include:

- Control system theory, such as modern control, adaptive control, robust control, nonlinear control, optimal control, and model predictive control
- Nonlinear state estimation and system identification
- Energy, oil ,gas and process control applications
- Dynamical optimization and stochastic analysis
- Data driven technic including neural network, fuzzy logic, and evolutionary algorithms (such as ant colony, genetic algorithm, Invasive Weed Optimization (IWO)).
- Simulation and modeling of Process system and Multiphase flow
- Code development

Proven records of research skills; problem solving and critical thinking. Self-motivated professional ,capable of working independently or as member of a team.

## PROFESSIONAL DEVELOPMENT AND TRAINING

- Industrial training course on PLC:OMRON, S7 300
- Industrial training course on Practical Applications of Underbalanced Operations (UBO) & Managed pressure drilling (MPD)

## **TECHNICAL SKILLS**

Department of Electrical Engineering K. N. Toosi University of Technology Postal address: Seyyed Khandan Bridge, Shariati Street, P.O. Box 16315-1355., Tehran, Iran

• Programming Languages and Tools: Matlab , C++, Pascal, basic

- Professional Software's: Simulink, Control toolbox, Quartus, ModelSim, HSpice, PSpice,
- Hardware Description Language: Verilog.
- Excellent experience in working with MATLAB and Quartus

#### **HONORS:**

- University of Tehran, Faculty of Engineering scholarship as an exceptional student in:Fall 2004
   Spring 2005 Fall 2005 Spring 2006 Fall 2006 Spring2007 Fall 2007 Spring 2008 Fall 2008
   Spring 2009 Fall 2009 Spring 2010
- Ranked first among all of the students of the Control Department in MSc (GPA: 19.08/20.00)
- Ranked second among all of the students of the Control Department in BSc (GPA: 18.01/20.00)
- Ranked 112th among hundreds of thousands participants in nationwide university entrance exam (Summer 2004)
- Ranked 40th among thousands of participants in nationwide university M.Sc. Entrance exam (Summer 2008)
- Ranked 7th in Iranian National Olympiad in electrical engineering.

## **MEMBERSHIPS/COMMITTEE WORK**

- Member of the central committee of the 6th International Conference on Millimeter-Wave and Terahertz Technologies (MMWaTT),2022.
- Chair of IEEE Iran Section Student Activities Committee, 2017-2020
- Member of the scientific Committee of the 8th Joint Congress on Fuzzy and Intelligent Systems (CFIS2020), Mashhad, Iran, 2020.
- Member of the scientific Committee of the 7th international conference on Control, Instrumentation and Automation (ICCIA 2020).
- Member of the scientific Committee of the 7th Iranian Joint Congress on Fuzzy and Intelligent Systems, 2019
- Member of the central committee of the 25TH Iranian Conference on Electrical Engineering, 2017.
- IEEE Student Branch of University of Tehran branch mentor, 2009-2012.
- Member of the central committee of the 1th IEEESPC (IEEE Student Paper Contest) held in University of Tehran, 2009.
- IEEE Student Branch of University of Tehran chairman, 2008- 2009.
- IEEE Student Branch of University of Tehran treasury, 2006- 2007.
- Active member of IEEE Student Branch of University of Tehran, 2004-2011.
- Member of the Executive committee of the Seminar on Automotive Electronics Industry Roadmap, University of Tehran & IranKhodro, 2007

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• Member of the central committee of The 9<sup>TH</sup> National Student Conference in Electrical Engineering, University of Tehran, 2006.

• Member of the central committee of 3<sup>rd</sup> international conference on machine vision and image processing, University of Tehran, 2005.