

VAHAB NEKOUKAR

ASSOCIATE PROFESSOR OF CONTROL ENGINEERING

SHAHID RAJAEI UNIVERSITY

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PROFILE

Associate professor with 8 years of experience in course developing and teaching at both undergraduate and postgraduate levels. Supervising more than 15 MSc theses and Ph.D. dissertations. Writing grants for research and industrial programs. 6 years of experience in clinical research and assessment of neural engineering. 5 years of experience in industrial companies doing R/D project management in aerospace, electromechanics, and control fields.

SKILLS

Airsim

LABVIEW

MS PROJECT

ALTIUM DESIGNER

MATLAB/SIMULINK

PYTHON FOR MACHINE LEARNING

MICROCONTROLLER PROGRAMMING

RESEARCH EXPERIENCE

Iran University of Science and Technology

2012-2014

Graduate Researcher

- Design and implementation of different control schemes on paraplegic subjects using functional electrical stimulation

Clinical Director at Iran Neural Technology Center

Shahid Rajaei University

2014-now

Artificial Pancreas

- Collaborated with Royan Institute for Stem Cell Biology and Technology to develop the artificial pancreas for regulation of blood glucose level in type 1 diabetic patients

Melanoma cancer

- Collaborated with Royan Institute for Stem Cell Biology and Technology to propose a new model of tumor growth during the drug therapy in presence of drug resistance
- Developing and evaluating personalized cancer therapy based on an individual-based mathematical model of muse

Robotics

- Improved the performance of a walking exoskeleton by FES
- Provided grants for design and production of autonomous flight control and managed a project team
- Developed a real-time path planning for UAV on CAN bus
- Proposed a formation control method of UAV swarm according to the needs of the industry

MPC Motor Control

- Five peer-reviewed publications in IEEE Transactions based on the experimental results.

Myoelectric Control

- Collaborated with international scientific groups for developing myoelectric control methods of prosthetic hands using deep learning

EDUCATION

Ph.D. Electrical Engineering

2007-2012

Iran University of Science and Technology

Dissertation: Robust Control of Paraplegic Walking Using Functional Electrical Stimulation

M.Sc. Electrical Engineering

2005-2007

Tarbiat Modares University

B.Sc. Electrical Engineering

2000-2005

K. N. Toosi University

AWARDS

Stanford's Top 2% Scientist 2023.

Distinguished Professor Awards in Education at Shahid Rajaei University, 2019.

Distinguished Professor Awards in Research at Shahid Rajaei University, 2020.

RESEARCH INTERESTS

- Control of multi-rotor drones and drone swarms
- Control of biological systems such as neuromusculoskeletal systems and personalized treatment of cancer
- Deep learning and reinforcement learning
- Algorithmic trading, prediction and, classification of financial time series

TEACHING EXPERIENCES

Undergraduate: Linear Control Lab, Measurement and Electrical Circuit Lab, Electrical Measurement, Microprocessors, Microcontrollers, Modern Control, Electrical Circuit, Linear Control.

Postgraduate: Adaptive Control, Fuzzy Control, Neural Control, Optimal Control, Evolutionary Algorithms, Theory of Linear Systems.

RELATED PROFESSIONAL EXPERIENCES

Project Manager in Farda System Company

- Design and implementation of inertial navigation systems for aircrafts
- Design and implementation of various electromechanical indicators for aircrafts
- Modelling and simulation of projectiles
- Design and implementation of navigation and guidance for projectiles

Cognitive Sciences and Technologies Council

- A survey on cognitive technologies and equipment available in the world for students' education

ADMINISTRATIVE EXPERIENCE

Head of the Control Department

Faculty Vice-Chancellor for Education and Research

Director of Postgraduate Office

Sharif University of Technology

- Design and implementation of automotive cruise control

SELECTED PEER-REVIEWED PUBLICATIONS

- Adaptive fuzzy terminal sliding mode control for a class of MIMO uncertain nonlinear systems. *Fuzzy sets and systems*, 2011.
- A decentralized modular control framework for robust control of FES-activated walker-assisted paraplegic walking using terminal sliding mode and fuzzy logic control. *IEEE Transactions on Biomedical Engineering*, 2012.
- Finite-set model predictive control of melanoma cancer treatment using signaling pathway inhibitor of cancer stem cell. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2019.
- Even-handed sequential predictive torque and flux control. *IEEE Transactions on Industrial Electronics*, 2019.
- Online weighting factor optimization by simplified simulated annealing for finite set predictive control. *IEEE Transactions on Industrial Informatics*, 2020.
- A robust torque and flux prediction model by a modified disturbance rejection method for finite set model predictive control of induction motor. *IEEE Transactions on Power Electronics*, 2021.
- Robust path tracking of a quadrotor using adaptive fuzzy terminal sliding mode control. *Control Engineering Practice*, 2021.
- Control of functional electrical stimulation systems using simultaneous pulse width, amplitude, and frequency modulations. *NEUROMODULATION: TECHNOLOGY AT THE NEURAL INTERFACE*, 2021.
- Predictive Torque Control of Induction Motor Based on a Robust Integral Sliding Mode Observer. *IEEE Transactions on Industrial Electronics*, 2022.