VAHAB NEKOUKAR

ASSISTANT PROFESSOR OF CONTROL ENGINEERING

SHAHID RAJAEE UNIVERSITY

CONTACT

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PROFILE

Assistant professor with 6 years of experience in course developing and teaching at both undergraduate and postgraduate levels. Supervising 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

C++
LABVIEW
MS PROJECT
ALTIUM DESIGNER
MATLAB/SIMULINK
PYTHON FOR MACHINE LEARNING
MICROCONTROLLER PROGRAMMING

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

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 Rajaee 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

AWARDS

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

Distinguished Professor Awards in Research at Shahid Rajaee 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: 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

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***, 2020.
- 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***, 2020.
- Robust path tracking of a quadrotor using adaptive fuzzy terminal sliding mode control. ***Control Engineering Practice***, 2021.
- Real-time UAV path planning by parallel grey wolf optimization with align coefficient on CAN bus. ***Cluster Computing***, 2021.