ARAS HI-TECH ROBOTIC SOLUTIONS
ADVANCED ROBOTICS & AUTOMATED SYSTEMS

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Industrial Control Center of Excellence
K. N. Toosi University of Technology

ARAS Workshop

Nonlinear Observers methods and Application

Speaker

Hamid D. Taghirad, Professor
Department of Systems and Control, Faculty of Electrical Engineering, K. N. Toosi University of Technology.
Director of Advanced Robotics and Automated Systems, and University Vice-Chancellor for Global Strategies and International Affairs.

Biography:

Hamid D. Taghirad has received his B.Sc. degree in mechanical engineering from Sharif University of Technology, Tehran, Iran, in 1989, his M.Sc. in mechanical engineering in 1993, and his Ph.D. in electrical engineering in 1997, both from McGill University, Montreal, Canada. He is currently the University Vice-Chancellor for Global strategies and International Affairs, Professor and the Director of the Advanced Robotics and Automated System (ARAS), Department of Systems and Control, Faculty of Electrical Engineering, K. N. Toosi University of Technology, Tehran, Iran. He is a senior member of IEEE, and Editorial board of International Journal of Robotics: Theory and Application, and International Journal of Advanced Robotic Systems. His research interest is robust and nonlinear control applied to robotic systems. His publications include five books, and more than 250 papers in international Journals and conference proceedings.

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Abstract

In this workshop we review **design of observers for nonlinear systems**. Observers are essential for feedback control of systems when not all the states are available. Although this necessity motivates the researcher to develop several efficient techniques to estimate the dynamic behavior of systems, the application of observers are not limited to state feedback design. Different estimators, and estimation techniques are developed in this field and applied for a variety of industrial application including system performance monitoring, system dynamic perdition, fault diagnosis and tolerance, etc. In this workshop an introduction to this vast area of research is given. First, a review on linear observer designs are given, and the optimal Kalman filter formulation is introduced. Then the use of this design for linearized system is given, and the design is generalized to extended Kalman filter (EKF) with variable observer gain. Finally the design of nonlinear observer for known and uncertain system is elaborated, and high gain observers are described. Some example and applications are introduced for better comprehension of the theoretical developments.

Date & Time

Date: Monday, Feb. 22, 2021 (4 Esfand 1399)

Time: 18:30-21:00 (+3:30 GMT Tehran local time)

10:00-12:30 (-5:00 GMT Canada Eastern Time Zone)

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