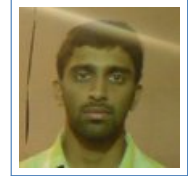


Rihab Abdul Razak

Resume

Research Scholar
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Education

- 2015-present **PhD (currently pursuing)**, *IITB-Monash Research Academy (a collaborative program between IIT Bombay and Monash University)*, Mumbai, India.
Systems and Control Engineering
Thesis: Distributed Adaptive Control of Mobile Sensor Networks: Coverage and Estimation Algorithms.
Advisors: Dr. Srikant Sukumar (IIT Bombay), Dr. Hoam Chung (Monash University)
Abstract: The thesis deals with decentralized and adaptive control strategies for multi-agent systems with application to coverage control and estimation of scalar fields over compact subsets of euclidean space.
Courses: Systems Theory, Probability and Random Processes, Modelling and Identification, Control of Nonlinear Systems, Adaptive Control, Advanced Mobile Robotics, Optimal Control Systems, Real Analysis, Geometric and Analytic Dynamics.
- 2009-2012 **Master of Technology**, *Indian Institute of Technology Bombay*, Mumbai, India.
Electrical Engineering with specialization in Control and Computing
Thesis: Data based Techniques for Fault Diagnosis of Self Powered Neutron Detectors
Advisors: Dr. Mani Bhushan (IIT Bombay), Dr. Madhu Belur (IIT Bombay)
Courses: Applied Linear Algebra, Multivariable Control Systems, Matrix Computations, Nonlinear Dynamical Systems, Optimal Control, Behavioral Systems Theory, Process Modelling and Identification, State Estimation.
- 2002-2006 **Bachelor of Technology**, *University of Calicut*, Calicut, India.
Electrical and Electronics Engineering

Areas of Interest

Dynamical Systems and Control, Adaptive and Learning methods in Control, Applications to Multi-agent Systems, Numerical Computation, Data Analysis, Parallel Computing.

Experience

- Aug 2012 - **System Engineer/Researcher R&D**, *Tata Consultancy Services*, Mumbai,
Dec 2014 India.
Worked on software development for High Performance Computing Systems; specifically has worked with HPC tools such as OpenMP, MPI, CUDA etc on supercomputing platforms. I have experience in optimizing computing applications on GPUs and Intel architectures including the Xeon Phi. I have been involved in the optimization and parallelization of applications such as Financial option pricing using Montecarlo method, Grid Search algorithm used for parameter estimation in PK-PD modelling, CFD applications etc.
- July 2009 - **Research Assistant**, *Indian Institute of Technology Bombay*, Mumbai, India.
June 2012 Research Assistant for a project titled Fault Detection and Diagnosis of Self Powered Neutron Detectors sponsored by the Board of Research for Nuclear Sciences, India. The aim of the research work was to develop automated methods for detection/diagnosis of faults in the SPNDs, given their measurement data. Self Powered Neutron Detectors (SPNDs) are used for measuring neutron flux in nuclear reactors. They work on the principle of radioactivity. The output of SPND is a current signal normally in the $\mu A/nA$ range. SPNDs are of different types depending on the material used and their dynamics. Several SPNDs are distributed throughout a reactor to measure the flux at different points.
- Dec 2007 - **Engineer(Design)**, *Hindustan Aeronautics Ltd.*, Bengaluru, India.
July 2009 Involved in a project on the design/development of test-bed for a Gearbox assembly. Work included development of PLC programs and LabView based interfaces for controlling a motor drive and various other equipments/devices in the testbed. Attended one semester training course at IIT Kanpur on Aeronautical engineering - training included basics of aerodynamics, flight mechanics, avionics, propulsion systems, aero structures and manufacturing technology.
- Aug 2006 - **Software Engineer**, *Accenture Services Pvt. Ltd.*, Chennai, India.
Dec 2007 Manual Testing of Banking Software

Publications, Presentations

- 1 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Estimating Scalar Fields with Mobile Sensor Networks*, accepted for presentation at the *6th Indian Control Conference (ICC)*, Dec. 2019.
- 2 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Distributed Adaptive Coverage Control of Differential Drive Robotic Sensors*, <http://arxiv.org/abs/1908.01161> *arXiv:1908.01161*, 2019.
- 3 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Scalar Field Estimation with Mobile Sensor Networks*, under review, pre-print available at <http://arxiv.org/abs/1907.01309> *arXiv:1907.01309*, 2019.
- 4 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Distributed Coverage Control of Mobile Sensors: Generalized Approach using Distance Functions*, *Proceedings of the 57th IEEE Conf. on Decision and Control (CDC)*, Dec. 2018.
- 5 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Decentralized and adaptive control of multiple nonholonomic robots for sensing coverage*, *Int J Robust Nonlinear Control*, volume 28, no.6, 2636-2650, 2018.

- 6 Rihab Abdul Razak, Sukumar Srikant, Hoam Chung *Decentralized Adaptive Coverage Control of Nonholonomic Mobile Robots, IFAC-PapersOnLine, Proceedings of the 10th IFAC Symposium on Nonlinear Control Systems (NOLCOS)*, volume 49, no. 18, pages 410-415, Aug. 2016.
- 7 Rihab Abdul Razak, Mani Bhushan, Madhu N. Belur, A. P. Tiwari, M. G. Kelkar, M. Pramanik *Clustering of Self Powered Neutron Detectors: Combining Prompt and Slow Dynamics, IEEE Transactions on Nuclear Science*, volume 61, no.6, pages 3635-3643, 2014.
- 8 Rihab Abdul Razak, M. Bhushan, M.N.Belur, A.P.Tiwari, M.G.Kelkar, M.Pramanik *Data reconciliation and gross error analysis of self powered neutron detectors: Comparison of PCA and IPCA based models, International journal of advances in engineering sciences and applied mathematics*, volume 4, no. 1-2, pages 91-115, 2012.
- 9 Selvaraj Karikalan, Madhu N. Belur, Chirayu D. Athalye and Rihab Abdul Razak, *Uncontrollable dissipative systems: observability and embeddability, International Journal of Control*, volume 85, no. 9, pages 1-19, 2013.
- 10 Nishant Agrawal, R. Narayanan, Manoj Nambiar, Rihab Abdulrazak, Ambuj Pandey, Shyamsundar Das *Parallel Implementation of PK-PD Parameter Estimation on GPU using Grid Search Method*, presented at *GPU Technology Conference*, March 24-27 2014, San Jose.

Computer Skills

Languages	MATLAB, C/C++, LABVIEW, SCILAB
Tools	ROS (Robot Operating System), MPI, CUDA, OpenMP
Platforms	Linux, Microsoft Windows
Others	LaTeX

Other

Reviewer	Regular reviewer for the International Journal of Robust and Nonlinear Control (Wiley Publications).
Workshop	Involved in the conduction of HPC (High Performance Computing) workshop at IUCAA, Pune University.
Workshop	Attended the EECI Graduate School on Control 2019 held at IIT Madras on "Practical Adaptive Control".

Personal Info

Birth	02 June 1984 (Kerala, India)
Nationality	Indian
Married	Yes
Languages	English, Hindi, Malayalam