

Farhad Farokhi

CONTACT INFORMATION

Farhad Farokhi, PhD Student,
KTH-Royal Institute of Technology,
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RESEARCH INTERESTS

Networked and Distributed Control and Estimation
Optimal Control, Optimal Stochastic Control, and Stochastic Systems
Nonlinear Control, Nonlinear Dynamics, and Chaos Theory
Impulsive and Hybrid Dynamical Equations

EDUCATION

Royal Institute of Technology, Stockholm, Sweden

Ph.D., Automatic Control, July 2010 - Present

Thesis: "Networked Control in Complex Systems"

Advisor: Prof. K. H. Johansson

Licentiate, Automatic Control, July 2010 - February 2012

Thesis: "Decentralized Control Design with Limited Plant Model Information"

Advisor: Prof. K. H. Johansson

Co-Advisor: Dr. A. Gattami

Reviewer: Prof. J. S. Shamma

Sharif University of Technology, Tehran, Iran

M.Sc., Electrical Engineering, September 2008 - February 2010

Thesis: "Optimal Design of Partial State-Feedback Controllers"

Advisor: Dr. M. Karimi-Ghartemani

Co-Advisor: Dr. H. Karimi

GPA: 18.80 (out of 20.00)

B.Sc., Electrical Engineering, September 2005 - September 2008

Thesis: "Methods for Solving Fractional Order Differential Equations"

Advisor: Prof. M. Haeri

GPA: 18.35 (out of 20.00)

HONORS AND AWARDS

Ranked 1st Among 15 M.Sc. Students in Control Systems, Department of Electrical Engineering, Sharif University of Technology, Tehran, Iran.

Ranked 1st Among 40 B.Sc. Students in Control Systems, Department of Electrical Engineering, Sharif University of Technology, Tehran, Iran.

Honorary Admission for Graduate Study in Control Systems, Electrical Engineering Department, Sharif University of Technology, Tehran, Iran.

Ranked 19th Among More Than 400,000 Participants in the University Entrance Exam for B.Sc. Degree in Iran.

Awarded Best Presentation in Session at American Control Conference (ACC 2012), June 27-29, 2012, Montreal, Canada.

Awarded travel grant to "Specification, Design and Verification of Distributed Embedded Systems" at EECI-HYCON2 Graduate School on Control 2011.

Silver Medal at 17th National Physics Olympiad in Iran.

JOURNAL PAPERS

- [J₅] **F. Farokhi**, K. H. Johansson, “Stochastic Sensor Scheduling for Networked Control Systems,” Submitted.
- [J₄] **F. Farokhi**, K. H. Johansson, “Optimal Control Design under Structured Model Information Limitation Using Adaptive Algorithms,” Submitted.
- [J₃] **F. Farokhi**, C. Langbort, K. H. Johansson, “Decentralized Disturbance Accommodation with Limited Plant Model Information,” Submitted.
- [J₂] **F. Farokhi**, C. Langbort, K. H. Johansson, “Optimal Structured Static State-Feedback Control Design with Limited Model Information for Fully-Actuated Systems,” To Appear in *Automatica*.
- [J₁] P. Mohajerin-Esfahani, **F. Farokhi**, M. Karimi-Ghartemani, “Optimal State-Feedback Design for Nonlinear Feedback-Linearizable Systems,” *IET Control Theory & Applications*, 5(2), pp. 323–333, 2011.

BOOK CHAPTERS

- [B₂] **F. Farokhi**, I. Shames, K. H. Johansson, “Distributed MPC Via Dual Decomposition and Alternative Direction Method of Multipliers,” To Appear in *Distributed MPC made Easy*.
- [B₁] **F. Farokhi**, M. Haeri, M. S. Tavazoei, “Comparing Numerical Methods for Solving Nonlinear Fractional Order Differential Equations,” *New Trends in Nanotechnology and Fractional Calculus Applications*, Springer, 2009, ISBN: 978-90-481-3292-8.

CONFERENCE PAPERS

- [C₁₂] **F. Farokhi**, K. H. Johansson, “Stochastic Sensor Scheduling with Application to Networked Control,” Submitted.
- [C₁₁] **F. Farokhi**, H. Sandberg, K. H. Johansson, “Complexity Reduction for Parameter-Dependent Linear Systems,” Submitted.
- [C₁₀] **F. Farokhi**, K. H. Johansson, “Limited Model Information Control Design for Linear Discrete-Time Systems with Stochastic Parameters,” *Accepted for presentation at the 51st IEEE Conference on Decision and Control*, Maui, Hawaii, USA, December 10-13, 2012.
- [C₉] **F. Farokhi**, C. Langbort, K. H. Johansson, “Optimal Disturbance-Accommodation Design with Limited Model Information,” *American Control Conference (ACC 2012)*, June 27-29, 2012, Montreal, Canada.
- [C₈] M. Larsson, J. Lindberg, J. Lycke, K. Hansson, A. Khakulov, E. Ringh, F. Svensson, I. Tjernberg, A. Alam, J. Araujo, **F. Farokhi**, E. Ghadimi, A. Teixeira, D. V. Dimarogonas, K. H. Johansson, “Towards an Indoor Testbed for Mobile Networked Control Systems,” *First Workshop on Research, Development, and Education on Unmanned Aerial Systems (RED-UAS 2011)*, November 30-December 1, 2011, Seville, Spain.
- [C₇] **F. Farokhi**, K. H. Johansson, “Dynamic Control Design Based on Limited Model Information,” *Annual Allerton Conference on Communication, Control, and Computing (Allerton 2011)*, September 28-30, 2011, Monticello, Illinois, USA.
- [C₆] **F. Farokhi**, H. Sandberg, “A Robust Control-Design Method Using Bode’s Ideal Transfer Function,” *Mediterranean Conference on Control and Automation (MED 2011)*, June 20-23, 2011, Corfu Island, Greece.
- [C₅] **F. Farokhi**, C. Langbort, K. H. Johansson, “Control Design with Limited Model Information,” *American Control Conference (ACC 2011)*, June 29-July 1, San Francisco, California, USA.
- [C₄] **F. Farokhi**, M. Haeri, M. S. Tavazoei, “On Comparison of Numerical Methods to Solve Nonlinear Fractional Order Differential Equations,” *Fractional Difference and its Application (FDA 2008)*, November 15-17, 2008, Ankara, Turkey.
- [C₃] **F. Farokhi**, B. Farokhi, “Chaos Control by Non-feedback Methods in the Motion of Two Competing Vehicles with Traffic Lights,” *Chaotic Modeling and Simulation International Conference (CHAOS 2008)*, June 3-6, 2008, Chania Crete, Greece.

[C₂] **F. Farokhi**, B. Farokhi, “Time Series Analysis in Chaotic Chua’s Circuit,” *Chaotic Modeling and Simulation International Conference (CHAOS 2008)*, June 3-6, 2008, Chania Crete, Greece.

[C₁] **F. Farokhi**, B. Farokhi, “Synchronization of Two Different Chaotic Systems via Active Control,” *Chaotic Modeling and Simulation International Conference (CHAOS 2008)*, June 3-6, 2008, Chania Crete, Greece.

TECHNICAL
REPORTS

[T₂] **F. Farokhi**, C. Langbort, K. H. Johansson, “Decentralized H₂ Control Design with Limited Model Information,” Tech. Rep. TRITA-EE 2011:064, 2011.

[T₁] **F. Farokhi**, C. Langbort, K. H. Johansson, “On Designing Optimal Controllers with Limited Model Information,” Tech. Rep. TRITA-EE 2010:039, 2010.

OTHER
PUBLICATIONS

[O₂] **F. Farokhi**, C. Langbort, and K. H. Johansson, “On the Value of Model Information in Decentralized Control Design,” June 12-14, 2012, Reglermöte, Uppsala, Sweden.

[O₁] K. H. Johansson, **F. Farokhi** and C. Langbort, “On the Role of Plant Model Information in Large-scale Control Systems,” Control Theory: Mathematical Perspectives on Complex Networked Systems, Report No. 12/2012, February 26 - March 3, 2012, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach-Walke, Germany.

WORK
EXPERIENCES

Automatic Control Laboratory, KTH- Royal Institute of Technology, Stockholm, Sweden
Researcher **April 2010 - Present**

Advanced Control Systems Laboratory, Sharif University of Technology, Tehran, Iran
Researcher **September 2006 - September 2008**

STUDENTS

B.Sc. Students

- I. Tjernberg, J. Lindberg, K. Hansson, “Cooperative Networked Control of Unmanned Air Vehicles,” 2011. (co-supervised with J. Araujo)
- E. Ehrlin, M. Törnqvist, “Networked Control of Autonomous Ground Vehicles”, 2012.
- C. Olsson, L. Brandt, T. Axelsson, “Detection and Tracking using Wireless UWB and Camera Networks”, 2012.

TEACHING
EXPERIENCE

Teaching Assistant for Nonlinear Control Course, Fall 2012, Prof. E. Jacobsen

Teaching Assistant for Basic Control Laboratory, Fall 2012, Prof. B. Wahlberg

Teaching Assistant for Nonlinear Control Course, Fall 2011, Prof. E. Jacobsen

Teaching Assistant for Basic Control Course, Fall 2010, Dr. H. Sandberg

Teaching Assistant for Basic Control Laboratory, Fall 2010, Dr. H. Sandberg

Teaching Assistant for Modern Control Course, Spring 2009, Dr. H. Karimi

Teaching Assistant for Linear Control Systems Laboratory, Spring 2009, Dr. M. Mobed

Teaching Assistant for Linear Control System Course, Fall 2008, Dr. M. Karimi-Ghartemani

Teaching Assistant for Introduction to Electrical Engineering Course, Fall 2008, Dr. F. Hadadi

Teaching Assistant for Electrical Measurement Course, Spring 2008, Dr. F. Hadadi

PROFESSIONAL
ACTIVITIES

Talks

- “On the Value of Model Information in Decentralized Control Design,” the Department of Applied Mathematics, Université Catholique de Louvain, August 28, 2012, Louvain-la-Neuve, Belgium.
- “Optimal Disturbance-Accommodation Design with Limited Model Information,” American Control Conference (ACC 2012), June 27-29, 2012, Montreal, Canada. **Awarded Best Presentation in Session.**
- “Decentralized Control Design with Limited Plant Model Information,” Licentiate Seminar, February 24, 2012, Stockholm, Sweden.
- “Control Design with Limited Model Information,” American Control Conference (ACC 2011), June 29-July 1, 2011, San Francisco, California, USA.

- “A Robust Control-Design Method Using Bode’s Ideal Transfer Function,” Mediterranean Conference on Control and Automation (MED 2011), June 20-23, 2011, Corfu Island, Greece.

Visits

- Department of Applied Mathematics, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, August 27 - 31, 2012.
- Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA, October 3 - 14, 2011.
- Stanford University, Stanford, California, USA, July 5, 2011.

Chairing and Organization of Technical Meetings

- Co-chair of the session “Decentralized Control II” in Mediterranean Conference on Control and Automation (MED 2011), June 20-23, 2011, Corfu Island, Greece.
- Co-organizer of NetCon internal workshop, February 11, 2011, Stockholm, Sweden.

Reviews

- **Journals:** Automatica, Nonlinear Analysis: Hybrid Systems, International Journal of Robust and Nonlinear Control, IEEE Journal on Selected Areas in Communications, Optimal Control, Applications and Methods.
- **Conferences:** IEEE International Conference on Automation Science and Engineering, American Control Conference, IEEE Conference on Decision and Control, Mediterranean Conference on Control and Automation, European Control Conference.

Membership of Committees and Professional Societies

- Graduate student member of IEEE and SIAM.

Pedagogical Education

- Basic Communication and Teaching, KTH- Royal Institute of Technology, Stockholm, Sweden, 2012.

EXTRACURRICULAR ACTIVITIES Mountain Climbing, Ping-Pong, and Swimming
Listening to Music, Reading Books, and Watching Movies