

# Farhad Farokhi

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## Experience

### The University of Melbourne

Lecturer, *Department of Electrical and Electronic Engineering*

Research Fellow, *Department of Electrical and Electronic Engineering*

McKenzie Fellow, *Department of Electrical and Electronic Engineering*

Research Fellow, *Department of Electrical and Electronic Engineering*

**Australia**

Apr 2020–Present

June 2018–Apr 2020

June 2016–June 2018

Sept 2014–June 2016

### The Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Research Scientist, *Information Security and Privacy Group, Data61*

**Australia**

June 2018–Apr 2020

### KTH Royal Institute of Technology

Post-doc, *Automatic Control Department*

PhD Student and Teaching Assistant, *Automatic Control Department*

**Sweden**

Mar 2014–Sept 2014

Apr 2010–Mar 2014

### University of California at Berkeley

Visiting Student Researcher, *Department of Electrical Engineering and Computer Sciences*

**USA**

May 2013–Aug 2013

## Education

### KTH Royal Institute of Technology

PhD in *Automatic Control*

**Sweden**

Apr 2010–Mar 2014

### Sharif University of Technology

MSc in *Electrical Engineering (Control Engineering)*

BSc in *Electrical Engineering (Control Engineering)*

**Iran**

Sept 2008–Feb 2010

Sept 2005–Sept 2008

## Grants, Awards, and Honors

- Discovery Project, Australian Research Council (ARC) 2020
- Engineering and Technology Award, Software and Computational Systems, Data61, CSIRO 2018, 2019
- Platforms for Open Data (PfOD), Department of the Prime Minister and Cabinet 2018, 2019
- National Energy Analytics Research (NEAR), Department of the Environment and Energy 2018, 2019
- Data Driven Cities & Energy Challenge, CSIRO 2018
- Next Generation Technologies Fund, Defence Science and Technology Group (DSTG) 2018
- VESKI Victoria Fellowship, Victorian State Government 2017
- Defence Science and Technology Group (DSTG) 2016
- McKenzie Fellowship, The University of Melbourne 2016
- Early Career Researcher Grant, The University of Melbourne 2015
- Outstanding reviewer, IEEE Transactions on Control of Network Systems 2015
- IEEE Control System Society Outreach Fund 2015
- Finalist in the European Embedded Control Institute (EECI) PhD Award 2014  
(1 of 4 PhD graduates from Europe in the field of Control for Complex and Heterogeneous Systems)
- Wallenberg Foundation Postdoctoral Scholarship at Stanford University (declined/prior commitment) 2014
- Best presentation in session at American Control Conference (ACC 2012) 2012
- Travel grant by Sten och Lisa Velanders Forskningsfond to attend IEEE CDC 2013
- Travel grant to attend EECI-HYCON2 Graduate School on Control 2011 2011

## Edited Books (total: 1)

[E<sub>1</sub>] **F. Farokhi**, "Privacy of Dynamical Systems," *Springer Nature*, Singapore, 2020.

## Journal Papers (total: 45)

Accepted/Published Journal Papers (36)

- [J<sub>1</sub>] C. Murguia, I. Shames, **F. Farokhi**, D. Nesic, H. V. Poor, "On Privacy of Dynamical Systems: An Optimal Probabilistic Mapping Approach," *IEEE Transaction on Information Forensics and Security*, 2020. In Press.
- [J<sub>2</sub>] **F. Farokhi**, "Deconvoluting Kernel Density Estimation and Regression for Locally Differentially Private Data," *Scientific Reports*, 2020. In Press.
- [J<sub>3</sub>] B. Liu, M. Ding, S. Shaham, W. Rahayu, **F. Farokhi**, Z. Lin, "When Machine Learning Meets Privacy: A Survey and Outlook," *ACM Computing Survey*, 2020. In Press.
- [J<sub>4</sub>] **F. Farokhi**, "Privacy-Preserving Public Release of Datasets for Support Vector Machine Classification," *IEEE Transactions on Big Data*, 2020. In Press.

- [J5] **F. Farokhi**, I. Shames, K. H. Johansson, "Private Ride Sharing and Routing Using Semi-Homomorphic Encryption," *IET Cyber-Physical Systems: Theory & Applications*, 2020. In Press.
- [J6] C. Murguia, **F. Farokhi**, I. Shames, "Secure and Private Implementation of Dynamic Controllers Using Semi-Homomorphic Encryption," *IEEE Transactions on Automatic Control*, 65 (9), pp. 3950–3957, 2020.
- [J7] N. Ding, **F. Farokhi**, "Developing Non-Stochastic Privacy-Preserving Policies Using Agglomerative Clustering," *IEEE Transaction on Information Forensics and Security*, 15, pp. 3911–3923, 2020.
- [J8] K. Wei, J. Li, M. Ding, C. Ma, H. H. Yang, **F. Farokhi**, S. Jin, T. Q. S. Quek, H. V. Poor "Federated Learning with Differential Privacy: Algorithms and Performance Analysis," *IEEE Transactions on Information Forensics and Security*, 15, pp. 3454–3469, 2020.
- [J9] **F. Farokhi**, "Privacy-Preserving Constrained Quadratic Optimization with Fisher Information," *IEEE Signal Processing Letters*, 27 (1), pp. 545–549, 2020.
- [J10] **F. Farokhi**, "Non-Stochastic Hypothesis Testing for Privacy," *IET Information Security*, 14 (6), pp. 754–763, 2020.
- [J11] **F. Farokhi**, "Review of Results on Smart-Meter Privacy by Data Manipulation, Demand Shaping, and Load Scheduling," *IET Smart Grid*, 3(5), pp. 605–613, 2020.
- [J12] J. Tran, **F. Farokhi**, M. Cantoni, I. Shames, "Implementing Homomorphic Encryption Based Secure Feedback Control," *Control Engineering Practice*, 97, pp. 1–12, 2020.
- [J13] **F. Farokhi**, I. Shames, M. Cantoni, "Optimal Contract Design for Effort-Averse Sensors," *International Journal of Control*, 93 (3), pp. 738–745, 2020.
- [J14] M. Cantoni, **F. Farokhi**, E. C. Kerrigan, I. Shames, "Structured Computation of Optimal Control for Constrained Cascade Systems," *International Journal of Control*, 93 (1), pp. 30–39, 2020.
- [J15] **F. Farokhi**, "Development and Analysis of Deterministic Privacy-Preserving Policies Using Non-Stochastic Information Theory," *IEEE Transactions on Information Forensics & Security*, 14 (10), pp. 2567–2576, 2019.
- [J16] **F. Farokhi**, M. Egerstedt "Optimal Stochastic Evasive Maneuvers Using the Schrödinger's Equation," *IEEE Control Systems Letters*, 3 (3), pp. 517–522, 2019.
- [J17] **F. Farokhi**, "Feedback Control Using a Strategic Sensor," *International Journal of Control*, 2019.
- [J18] **F. Farokhi**, H. Sandberg, "Ensuring Privacy with Constrained Additive Noise by Minimizing Fisher Information," *Automatica*, 99, pp. 275–288, 2019.
- [J19] **F. Farokhi**, H. Sandberg, "Fisher Information as a Measure of Privacy: Preserving Privacy of Households with Smart Meters Using Batteries," *IEEE Transactions on Smart Grid*, 9 (5), pp. 4726–4734, 2018.
- [J20] A. Keimer, N. Laurent-Brouty, **F. Farokhi**, H. Signargout, V. Cvetkovic, A. M. Bayen, K. H. Johansson, "Integration of Information Patterns in the Modeling and Design of Mobility Management Services," *Proceedings of the IEEE*, 106 (4), pp. 554–576, 2018.
- [J21] M. Schulze Darup, A. Redder, I. Shames, **F. Farokhi**, D. E. Quevedo, "Towards Encrypted MPC for Linear Constrained Systems," *IEEE Control Systems Letters*, 2 (2), pp. 195–200, 2018.
- [J22] **F. Farokhi**, I. Shames, N. Batterham, "Secure and Private Control Using Semi-Homomorphic Encryption," *Control Engineering Practice*, 67, pp. 13–20, 2017.
- [J23] I. Shames, **F. Farokhi**, T. H. Summers, "Security Analysis of Cyber-Physical Systems Using  $\mathcal{H}_2$  Norm," *IET Control Theory & Applications*, 11 (11), pp. 1749–1755, 2017.
- [J24] G. Bottegal, **F. Farokhi**, I. Shames, "Preserving Privacy of Finite Impulse Response Systems," *IEEE Control Systems Letters*, 1 (1), pp. 128–133, 2017.
- [J25] T. Tanaka, **F. Farokhi**, C. Langbort, "Faithful Implementations of Distributed Algorithms and Control Laws," *IEEE Transactions on Control of Network Systems*, 4 (2), pp. 191–201, 2017.
- [J26] **F. Farokhi**, A. M. H. Teixeira, C. Langbort, "Estimation with Strategic Sensors," *IEEE Transactions on Automatic Control*, 62 (2), pp. 724–739, 2017.
- [J27] **F. Farokhi**, I. Shames, M. G. Rabbat, M. Johansson, "On Reconstructability of Quadratic Utility Functions from the Iterations in Gradient Methods," *Automatica*, 66, pp. 254–261, 2016.
- [J28] **F. Farokhi**, K. H. Johansson, "A Piecewise-Constant Congestion Taxing Policy for Repeated Routing Games," *Transportation Research Part B: Methodological*, 78, pp. 123–143, 2015.
- [J29] **F. Farokhi**, I. Shames, M. Cantoni, "Promoting Truthful Behavior in Participatory-Sensing Mechanisms," *IEEE Signal Processing Letters*, 22(10), pp. 1538–1542, 2015.
- [J30] **F. Farokhi**, K. H. Johansson, "A Study of Truck Platooning Incentives Using a Congestion Games," *IEEE Transactions on Intelligent Transportation Systems*, 16(2), pp. 581–595, 2015.
- [J31] **F. Farokhi**, K. H. Johansson, "Optimal Control Design under Limited Model Information for Discrete-Time Linear Systems with Stochastically-Varying Parameters," *IEEE Transactions on Automatic Control*, 60(3), pp. 684–699, 2015.
- [J32] **F. Farokhi**, K. H. Johansson, "Adaptive Control Design under Structured Model Information Limitation: A Cost-Biased Maximum-Likelihood Approach," *Systems & Control Letters*, 75, pp. 8–13, 2015.

- [J<sub>33</sub>] **F. Farokhi**, K. H. Johansson, "Stochastic Sensor Scheduling for Networked Control Systems," *IEEE Transactions on Automatic Control*, 59(5), pp. 1147–1162, 2014.
- [J<sub>34</sub>] **F. Farokhi**, C. Langbort, K. H. Johansson, "Decentralized Disturbance Accommodation with Limited Plant Model Information," *SIAM Journal on Control and Optimization*, 51(2), pp. 1543–1573, 2013.
- [J<sub>35</sub>] **F. Farokhi**, C. Langbort, K. H. Johansson, "Optimal Structured Static State-Feedback Control Design with Limited Model Information for Fully-Actuated Systems," *Automatica*, 49(2), pp. 326–337, 2013.
- [J<sub>36</sub>] P. M. Esfahani, **F. Farokhi**, M. Karimi-Ghartemani, "Optimal State-Feedback Design for Non-Linear Feedback-Linearisable Systems," *IET Control Theory & Applications*, 5(2), pp. 323–333, 2011.

#### Submitted Journal Papers (9)

- [J<sub>37</sub>] A. Zafar, M. Cantoni, **F. Farokhi**, "Structured Preconditioning of Conjugate Gradients for Path-Graph Network Optimal Control Problems," Submitted to *IEEE Transactions on Automatic Control*.
- [J<sub>38</sub>] **F. Farokhi**, "A Game-Theoretic Approach to Adversarial Linear Support Vector Classification," Submitted to *IFAC Journal of Systems & Control*.
- [J<sub>39</sub>] A. Lang, M. Cantoni, **F. Farokhi**, I. Shames, "Load Scheduling Under Constrained Linear Dynamics," Submitted to *IEEE Transactions on Control Systems Technology*.
- [J<sub>40</sub>] N. U. Sheikh, **F. Farokhi**, H. J. Asghar, M. A. Kaafar, "Do Statistical Models Protect Privacy? Inferring Fine-grained Energy Consumption from Aggregated Auto-Regressive Model Parameters," Submitted to *IEEE Transactions on Services Computing*.
- [J<sub>41</sub>] **F. Farokhi**, "Noiseless Privacy," Submitted to *IEEE Transactions on Dependable and Secure Computing*.
- [J<sub>42</sub>] A. Saberi, **F. Farokhi**, G. Nair, "Bounded Estimation over Finite-State Channels: Relating Topological Entropy and Zero-Error Capacity," Submitted to *IEEE Transaction on Automatic Control*.
- [J<sub>43</sub>] **F. Farokhi**, "Why Does Regularization Help with Mitigating Poisoning Attacks?," Submitted to *Neural Processing Letters*, 2020.
- [J<sub>44</sub>] **F. Farokhi**, "Distributionally-Robust Machine Learning Using Locally Differentially-Private Data," Submitted to *Optimization Letters*, 2020.
- [J<sub>45</sub>] **F. Farokhi**, N. Wu, D. Smith, M. A. Kaafar, "The Cost of Privacy in Asynchronous Differentially-Private Machine Learning," Submitted to *IEEE Transactions on Information Forensics and Security*, 2020.

## Conference Papers (total: 61)

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#### Accepted/Published Peer-Reviewed Conference Papers (53)

- [C<sub>1</sub>] A. Saberi, **F. Farokhi**, G. Nair, "An Explicit Formula for the Zero-Error Feedback Capacity of a Class of Finite-State Additive Noise Channels," in *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, June 21-26, 2020, Los Angeles, CA, USA.
- [C<sub>2</sub>] **F. Farokhi**, "Temporally Discounted Differential Privacy for Evolving Datasets on an Infinite Horizon," in *Proceedings of the 11th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)*, Apr 22-24, 2020, Sydney, Australia. (**Acceptance Rate  $\approx$  24%**)
- [C<sub>3</sub>] N. Wu, **F. Farokhi**, D. Smith, M. A. Kaafar, "The Value of Collaboration in Convex Machine Learning with Differential Privacy," in *Proceedings of the 41st IEEE Symposium on Security and Privacy*, May 18-20, 2020, San Francisco, CA, USA. (**Acceptance Rate  $\approx$  12%**)
- [C<sub>4</sub>] A. Zafar, **F. Farokhi**, M. Cantoni, "Linear Quadratic Control Computation for Systems with a Directed Tree Structure," in *Proceedings of the 21st World Congress of the International Federation of Automatic Control (IFAC)*, July 12-17, 2020, Berlin, Germany.
- [C<sub>5</sub>] C. Murguia, I. Shames, **F. Farokhi**, D. Nescic, "Privacy Against State Estimation: An Optimization Framework based on the Data Processing Inequality," in *Proceedings of the 21st World Congress of the International Federation of Automatic Control (IFAC)*, July 12-17, 2020, Berlin, Germany.
- [C<sub>6</sub>] **F. Farokhi**, "A Fundamental Bound on Performance of Non-Intrusive Load Monitoring with Application to Smart Meter Privacy," in *Proceedings of the 21st World Congress of the International Federation of Automatic Control (IFAC)*, July 12-17, 2020, Berlin, Germany.
- [C<sub>7</sub>] **F. Farokhi**, "Non-Stochastic Hypothesis Testing with Application to Privacy Against Hypothesis-Testing Adversary," in *Proceedings of the 58th IEEE Conference on Decision and Control (CDC)*, Dec 11-13, 2019, Nice, France.
- [C<sub>8</sub>] A. Zafar, M. Cantoni, **F. Farokhi**, "Optimal Control Computation for Cascade Systems by Structured Jacobi Iterations," in *Proceedings of the 8th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Sept 16-17, 2019, Chicago, IL, USA.
- [C<sub>9</sub>] A. Saberi, **F. Farokhi**, G. Nair, "State Estimation via Worst-Case Erasure and Symmetric Channels with Memory," in *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, July 7-12, 2019, Paris, France.

- [C<sub>10</sub>]J. Tran, **F. Farokhi**, M. Cantoni, I. Shames, "Digital Implementation of Homomorphically Encrypted Feedback Control for Cyber-Physical Systems," in *Proceedings of the 2nd Workshop on Cyber-Physical Systems Security and Resilience (CPS-SR), Cyber-Physical Systems and Internet-of-Things (CPS-IoT) Week*, Apr 15, 2019, Montreal, Canada.
- [C<sub>11</sub>]**F. Farokhi**, P. M. Esfahani, "Security versus Privacy," in *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, Dec 17-19, 2018, Miami Beach, FL, USA.
- [C<sub>12</sub>]Y. Lin, **F. Farokhi**, I. Shames, D. Nešić, "Secure Control of Nonlinear Systems Using Semi-Homomorphic Encryption," in *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, Dec 17-19, 2018, Miami Beach, FL, USA.
- [C<sub>13</sub>]C. Murguia, I. Shames, D. Nešić, **F. Farokhi**, "On Privacy of Quantized Sensor Measurements through Additive Noise," in *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, Dec 17-19, 2018, Miami Beach, FL, USA.
- [C<sub>14</sub>]**F. Farokhi**, I. Shames, "Bilateral Trade Under Information Asymmetry and Quantized Measurements," in *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, Dec 17-19, 2018, Miami Beach, FL, USA.
- [C<sub>15</sub>]A. Saberi, **F. Farokhi**, G. Nair, "Estimation and Control over a Nonstochastic Binary Erasure Channel," in *Proceedings of the 7th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Aug 27–28, 2018, Groningen, the Netherlands.
- [C<sub>16</sub>]M. Cantoni, A. Zafar, **F. Farokhi**, "Scalable Iterations for Solving Constrained LQ Control Problems with Cascade Dynamics", in *Proceedings of the 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, July 16–20, 2018, Hong Kong.
- [C<sub>17</sub>]**F. Farokhi**, D. Selvaratnam, I. Shames, "Security Analysis of Quantized Bayesian Estimators," in *Proceedings of the 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, July 16–20, 2018, Hong Kong.
- [C<sub>18</sub>]M. Zamani, L. Sadeghikhorrani, A. A. Safavi, **F. Farokhi**, "Secure State Estimation Using Semi-homomorphic Encryption," in *Proceedings of the 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, July 16–20, 2018, Hong Kong.
- [C<sub>19</sub>]**F. Farokhi**, I. Shames, "Compressive Sensing in Fault Detection," in *Proceedings of the American Control Conference (ACC)*, June 27–29, 2018, Milwaukee, WI, USA.
- [C<sub>20</sub>]**F. Farokhi**, H. Sandberg, "Optimal Constrained Additive Noise Distribution Minimizing Fisher Information for Ensuring Privacy," in *Proceedings of the 56th IEEE Conference on Decision and Control (CDC)*, Dec 12-15, 2017, Melbourne, Australia.
- [C<sub>21</sub>]**F. Farokhi**, I. Shames, K. H. Johansson, "Private and Secure Coordination of Match-Making for Heavy-Duty Vehicle Platooning," in *Proceedings of the 20th World Congress of the International Federation of Automatic Control (IFAC)*, July 9-14, 2017, Toulouse, France.
- [C<sub>22</sub>]**F. Farokhi**, J. Milosevic, H. Sandberg, "Optimal State Estimation with Measurements Corrupted by Laplace Noise," in *Proceedings of the 55th IEEE Conference on Decision and Control (CDC)*, Dec 12-14, 2016, Las Vegas, NV, USA.
- [C<sub>23</sub>]I. Shames, **F. Farokhi**, M. Cantoni, "Guaranteed Maximum Power Point Tracking by Scalar Iterations with Quadratic Convergence Rate," in *Proceedings of the 55th IEEE Conference on Decision and Control (CDC)*, Dec 12-14, 2016, Las Vegas, NV, USA.
- [C<sub>24</sub>]**F. Farokhi**, I. Shames, "Preserving Privacy of Agents in Participatory-Sensing Schemes for Traffic Estimation," in *Proceedings of the 55th IEEE Conference on Decision and Control (CDC)*, Dec 12-14, 2016, Las Vegas, NV, USA.
- [C<sub>25</sub>]**F. Farokhi**, I. Shames, N. Batterham, "Secure and Private Cloud-Based Control Using Semi-Homomorphic Encryption," in *Proceedings of the 6th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Sept 8-9, 2016, Tokyo, Japan.
- [C<sub>26</sub>]**F. Farokhi**, G. Nair, "Privacy-Constrained Communication," in *Proceedings of the 6th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Sept 8-9, 2016, Tokyo, Japan.
- [C<sub>27</sub>]**F. Farokhi**, M. Cantoni, I. Shames, "A Game-Theoretic Approach to Scheduling Rigid Demands on Dynamical Systems," in *Proceedings of the Australian Control Conference (AuCC)*, Nov 3-4, 2016, Newcastle, Australia.
- [C<sub>28</sub>]M. Cantoni, **F. Farokhi**, E. Kerrigan, I. Shames, "A Scalable QP Solver for Cascade Systems with Constrained Dynamics," in *Proceedings of the Australian Control Conference (AuCC)*, Nov 3-4, 2016, Newcastle, Australia.
- [C<sub>29</sub>]**F. Farokhi**, H. Sandberg, I. Shames, M. Cantoni, "Quadratic Gaussian Privacy Games," in *Proceedings of the 54th IEEE Conference on Decision and Control (CDC)*, Dec 15-18, 2015, Osaka, Japan.
- [C<sub>30</sub>]I. Shames, T. H. Summers, **F. Farokhi**, R. C. Shekhar, "Conditions and Strategies for Uniqueness of the Solutions to Cooperative Localization and Mapping Problems Using Rigidity Theory," in *Proceedings of the 54th IEEE Conference on Decision and Control (CDC)*, Dec 15-18, 2015, Osaka, Japan.

- [C<sub>31</sub>] **F. Farokhi**, M. Cantoni, I. Shames, "Scheduling Rigid Demands on Linear Time-Invariant Systems," in *Proceedings of the 54th IEEE Conference on Decision and Control (CDC)*, Dec 15-18, 2015, Osaka, Japan.
- [C<sub>32</sub>] **F. Farokhi**, M. Cantoni, "Distributed Negotiation for Scheduling Smart Appliances," in *Proceedings of the Australian Control Conference (AuCC)*, Nov 5-6, 2015, Gold Coast, Australia.
- [C<sub>33</sub>] **F. Farokhi**, K.-Y. Liang, K. H. Johansson, "Cooperation Pattern between Fleet Owners," in *Proceedings of the IEEE Conference on Control Applications (CCA)*, Sept 21-23, 2015, Sydney, Australia.
- [C<sub>34</sub>] M. Biel, **F. Farokhi**, H. Sandberg, "SiMpLIfy: A Toolbox for Structured Model Reduction," in *Proceedings of the European Control Conference (ECC)*, July 15–17, 2015, Linz, Austria.
- [C<sub>35</sub>] **F. Farokhi**, K. H. Johansson, "Using Piecewise-Constant Congestion Taxing Policy in Repeated Routing Games," in *Proceedings of SIAM Conference on Control and Its Applications (CT 2015)*, July 8-10, 2015, Paris, France.
- [C<sub>36</sub>] **F. Farokhi**, K. H. Johansson, "Investigating the Interaction between Traffic Flow and Vehicle Platooning Using a Congestion Game," in *Proceedings of the 19th World Congress of the International Federation of Automatic Control (IFAC)*, August 24-29, 2014, Cape Town, South Africa.
- [C<sub>37</sub>] **F. Farokhi**, A. M. H. Teixeira, C. Langbort, "Gaussian Cheap Talk Game with Quadratic Cost Functions: When Herding between Strategic Senders is a Virtue," in *Proceedings of the American Control Conference (ACC 2014)*, June 4-6, 2014, Portland, OR, USA.
- [C<sub>38</sub>] **F. Farokhi**, A. M. H. Teixeira, C. Langbort, "Crowd-Sourcing Estimation with Strategic Senders," in *Proceedings of the Swedish Control Conference (Reglermöte)*, June 3-4, 2014, Linköping, Sweden.
- [C<sub>39</sub>] T. Tanaka, **F. Farokhi**, C. Langbort, "A Faithful Distributed Implementation of Dual Decomposition and Average Consensus Algorithms," in *Proceedings of the 52nd IEEE Conference on Decision and Control (CDC)*, Dec 10-13, 2013, Florence, Italy.
- [C<sub>40</sub>] **F. Farokhi**, H. Sandberg, K. H. Johansson, "Optimal  $H_\infty$  Control Design under Model Information Limitations and State Measurement Constraints," in *Proceedings of the 52nd IEEE Conference on Decision and Control (CDC)*, Dec 10-13, 2013, Florence, Italy.
- [C<sub>41</sub>] **F. Farokhi**, K. H. Johansson, "A Game-Theoretic Framework for Studying Platooning Incentives," in *Proceedings of the 16th International IEEE Annual Conference on Intelligent Transportation Systems (ITSC)*, Oct 6-9, 2013, The Hague, The Netherlands.
- [C<sub>42</sub>] **F. Farokhi**, W. Krichene, A. M. Bayen, K. H. Johansson, "A Heterogeneous Routing Game," in *Proceedings of the 51st Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Oct 2-4, 2013, Monticello, IL, USA.
- [C<sub>43</sub>] **F. Farokhi**, A. Shirazinia, K. H. Johansson, "Networked Estimation using Sparsifying Basis Prediction," in *Proceedings of the 4th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)*, Sept 25-26, 2013, Koblenz, Germany.
- [C<sub>44</sub>] **F. Farokhi**, K. H. Johansson, "Stochastic Sensor Scheduling with Application to Networked Control," in *Proceedings of the American Control Conference (ACC)*, June 17-19, 2013, Washington, DC, USA.
- [C<sub>45</sub>] **F. Farokhi**, H. Sandberg, K. H. Johansson, "Complexity Reduction for Parameter-Dependent Linear Systems," in *Proceedings of the American Control Conference (ACC)*, June 17-19, 2013, Washington, DC, USA.
- [C<sub>46</sub>] **F. Farokhi**, K. H. Johansson, "Limited Model Information Control Design for Linear Discrete-Time Systems with Stochastic Parameters," in *Proceedings of the 51st IEEE Conference on Decision and Control (CDC)*, Dec 10-13, 2012, Maui, HI, USA.
- [C<sub>47</sub>] **F. Farokhi**, C. Langbort, K. H. Johansson, "Optimal Disturbance-Accommodation Design with Limited Model Information," in *Proceedings of the American Control Conference (ACC)*, June 27-29, 2012, Montreal, Canada.
- [C<sub>48</sub>] **F. Farokhi**, C. Langbort, and K. H. Johansson, "On the Value of Model Information in Decentralized Control Design," in *Proceedings of the Swedish Control Conference (Reglermöte)*, June 12-14, 2012, Uppsala, Sweden.
- [C<sub>49</sub>] 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. H. Teixeira, D. V. Dimarogonas, K. H. Johansson, "Towards an Indoor Testbed for Mobile Networked Control Systems," in *Proceedings of the Workshop on Research, Development, and Education on Unmanned Aerial Systems*, Nov 30-Dec 1, 2011, Seville, Spain.
- [C<sub>50</sub>] **F. Farokhi**, K. H. Johansson, "Dynamic Control Design Based on Limited Model Information," in *Proceedings of the 49th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Sept 28-30, 2011, Monticello, IL, USA.
- [C<sub>51</sub>] **F. Farokhi**, H. Sandberg, "A Robust Control-Design Method Using Bode's Ideal Transfer Function," in *Proceedings of the Mediterranean Conference on Control and Automation (MED)*, June 20-23, 2011, Corfu Island, Greece.
- [C<sub>52</sub>] **F. Farokhi**, C. Langbort, K. H. Johansson, "Control Design with Limited Model Information," in *Proceedings of the American Control Conference (ACC)*, June 29-July 1, San Francisco, CA, USA.

[C<sub>53</sub>] **F. Farokhi**, M. Haeri, M. S. Tavazoei, "On Comparison of Numerical Methods to Solve Nonlinear Fractional Order Differential Equations," in *Proceedings of the 3rd IFAC Workshop on Fractional Difference and its Application (FDA)*, Nov 15-17, 2008, Ankara, Turkey.

Conference/Workshop Abstracts (5)

[C<sub>54</sub>] J. Kim, **F. Farokhi**, I. Shames, H. Shim, "Toward Nonlinear Dynamic Control over Encrypted Data for Infinite Time Horizon," Late-Breaking Results at *the 21st World Congress of the International Federation of Automatic Control (IFAC)*, July 12-17, 2020, Berlin, Germany.

[C<sub>55</sub>] A. Saberi, **F. Farokhi**, G. Nair, "Nonstochastic Channel Models for Bounded State Estimation and Control," Invited Presentation at *2018 56th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Sept 2-5, 2018, Monticello, IL, USA.

[C<sub>56</sub>] **F. Farokhi**, "Non-Stochastic Privacy," Invited Presentation at *Workshop on Optimisation in Systems Engineering*, June 6, 2019, Melbourne, Australia.

[C<sub>57</sub>] **F. Farokhi**, "Monitoring and Control Systems with Crowd-Sourced Sensing and Actuation," Invited Presentation at *the 3rd Australian Applied Dynamics Workshop*, Feb 1-2, 2018, Australia.

[C<sub>58</sub>] **F. Farokhi**, "Estimation with Strategic Sensors with Application to Privacy-Constrained Communication," Invited Presentation at *the Applied Dynamics Workshop*, Feb 4-5, 2016, Blue Mountains, Australia.

Submitted Conference Papers (3)

[C<sub>59</sub>] **F. Farokhi**, M. A. Kaafar, "Modelling and Quantifying Membership Information Leakage in Machine Learning," Submitted to *Algorithmic Learning Theory (ALT)*, 2021.

[C<sub>60</sub>] I. Shames, **F. Farokhi**, "Online Stochastic Convex Optimization: Wasserstein Distance Variation," Submitted to *Algorithmic Learning Theory (ALT)*, 2021.

[C<sub>61</sub>] **F. Farokhi**, "Differential Privacy for Evolving Almost-Periodic Datasets with Continual Linear Queries: Application to Energy Data Privacy," Submitted to *the European Control Conference*, 2021.

## Book Chapters (total: 5)

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[B<sub>1</sub>] Y. Lin, **F. Farokhi**, I. Shames, D. Nešić, "Secure Networked Control Systems Design Using Semi-Homomorphic Encryption," in R. Ferrari, A. Teixeira, (Eds.), *Safety, Security, and Privacy for Cyber-Physical Systems*, Springer, 2021. In Press.

[B<sub>2</sub>] C. Murguia, I. Shames, **F. Farokhi**, and D. Nešić, "Information-Theoretic Privacy through Chaos Synchronization and Optimal Additive Noise," in F. Farokhi, (Eds.), *Privacy of Dynamical Systems*, Internet of Things, Springer, 2020.

[B<sub>3</sub>] **F. Farokhi**, H. Sandberg, "Fisher Information Privacy with Application to Smart Meter Privacy Using HVAC Units," in F. Farokhi, (Eds.), *Privacy of Dynamical Systems*, Internet of Things, Springer, 2020.

[B<sub>4</sub>] **F. Farokhi**, I. Shames, K. H. Johansson, "Distributed MPC via Dual Decomposition and Alternating Direction Method of Multipliers," in J. M. Maestre and R. R. Negenborn, (Eds.), *Distributed Distributed Model Predictive Control Made Easy*, Intelligent Systems, Control and Automation: Science and Engineering, 69, Springer, 2013.

[B<sub>5</sub>] **F. Farokhi**, M. Haeri, M. S. Tavazoei, "Comparing Numerical Methods for Solving Nonlinear Fractional Order Differential Equations," in D. Baleanu, Z. B. Guvenc, and J. A. T. Machado, (Eds.), *New Trends in Nanotechnology and Fractional Calculus Applications*, Springer, 2010.

## Technical Reports (total: 6)

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[T<sub>1</sub>] **F. Farokhi**, "Taking a Lesson from Quantum Particles for Statistical Data Privacy," arXiv:1908.04954 [cs.CR], 2019.

[T<sub>2</sub>] **F. Farokhi**, P. Tyler, J. Chan, T. Rakotoarivelo, H. J. Asghar, D. Smith, M. A. Kaafar, "Metric for Confidentiality-Breach Risk-Assessment," CSIRO Tech. Rep. EP193943, 2019.

[T<sub>3</sub>] **F. Farokhi**, P. Tyler, D. Vatsalan, H. J. Asghar, S. M'rabet, M. A. Kaafar, "Privacy-Preserving Release of Energy Data," CSIRO Tech. Rep. EP193857, 2019.

[T<sub>4</sub>] **F. Farokhi**, P. Tyler, D. Vatsalan, H. J. Asghar, S. M'rabet, M. A. Kaafar, "Differentially-Private Release of Summary Statistics of Victorian Electricity Bills," CSIRO Tech. Rep. EP193776, 2019.

[T<sub>5</sub>] **F. Farokhi**, C. Langbort, K. H. Johansson, "Decentralized H<sub>2</sub> Control Design with Limited Model Information," Tech. Rep. TRITA-EE 2011:064, 2011.

[T<sub>6</sub>] **F. Farokhi**, W. Krichene, A. M. Bayen, and K. H. Johansson, "When Do Potential Functions Exist in Heterogeneous Routing Games?," Tech. Rep. TRITA-EE 2014:009, 2014.

## Outreach and Media (total: 2)

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- [M<sub>1</sub>] H. Asghar, F. Farokhi, M. A. Kaafar, B. Rubinstein, "On the privacy of TraceTogether, the Singaporean COVID-19 contact tracing mobile app, and recommendations for Australia," Ingenium, Melbourne School of Engineering, April 6, 2020. <https://eng.unimelb.edu.au/ingenium/research-stories/world-class-research/real-world-impact/on-the-privacy-of-tracetogether,-the-singaporean-covid-19-contact-tracing-mobile-app,-and-recommendations-for-australia>
- [M<sub>1</sub>] F. Farokhi, "Protecting your privacy if you use a route mapping app," The Conversation, May 6, 2016. <http://theconversation.com/protecting-your-privacy-if-you-use-a-route-mapping-app-58512> Republished by Business Insider, Phys.org, StartupSmart, Australasian Science, Sciblogs, Digg (Reads: 10,416; Checked online on July 30, 2019 on The Conversations Author Dashboard).
- [M<sub>2</sub>] Interview, The Daily at 2SER, "Are Route Mapping Apps Truly Private?"

## Bibliometric Data

Google Scholar profile: Number of Citations: 716, h-index: 14, i10-index: 21

## Teaching Experience

<b>The University of Melbourne</b>	<b>Australia</b>
<i>Security of Networked Control Systems (Lecturer)</i>	2017
<i>Electrical Device Modelling (Guest Lecturer)</i>	2016, 2017
<i>Introduction to Optimisation (Guest Lecturer)</i>	2014
<b>KTH Royal Institute of Technology</b>	<b>Sweden</b>
<i>Nonlinear Control (teaching assistant)</i>	2011, 2012, 2013
<i>Basic Control Laboratory (Teaching Assistant)</i>	2010, 2012, 2013
<i>Basic Control (teaching assistant)</i>	2010
<b>Sharif University of Technology</b>	<b>Iran</b>
<i>Modern Control (Teaching Assistant)</i>	2009
<i>Linear Control Systems Laboratory (Teaching Assistant)</i>	2009
<i>Linear Control System (Teaching Assistant)</i>	2008
<i>Introduction to Electrical Engineering (Teaching Assistant)</i>	2008
<i>Electrical Measurement (Teaching Assistant)</i>	2008

## Academic Visits and Invited Talks

KTH Royal Institute of Technology (2015, 2016, 2018, 2019), ETH Zürich (2018), ShanghaiTech University, Tsinghua University, Chinese Academy of Sciences (2017), Defence Science Institute (DSI) and Raytheon (2017), University of Illinois at Urbana-Champaign (2011, 2016), Lund University (2016), Delft University of Technology (2016), Tokyo Institute of Technology (2015), Monash University, Rubicon Water pty ltd, IBM Research-Australia, University of Newcastle (2015), Australian National University (2014), Scania AB (2014), Ruhr-Universität Bochum (2014), MIT Massachusetts Institute of Technology (2013), Université Catholique de Louvain (2012), Stanford University (2011)

## Main Collaborators

M. A. Kaafar, H. J. Asghar (Macquarie University), D. Smith (CSIRO's Data61), M. Cantoni, G. Nair, and I. Shames (The University of Melbourne), K. H. Johansson, H. Sandberg, M. Johansson (KTH Royal Institute of Technology), C. Langbort (University of Illinois at Urbana-Champaign), A. M. Bayen (University of California at Berkeley), M. Egerstedt (Georgia Institute of Technology), M. G. Rabbat (McGill University and Facebook Research), E. C. Kerrigan (Imperial College London), D. Quevedo (Queensland University of Technology), M. Schulze Darup (Paderborn University), H. V. Poor (Princeton University), T. Tanaka (University of Texas at Austin), P. M. Esfahani (Delft University of Technology), G. Bottegal (ASML), A. Teixeira (Uppsala University), T. H. Summers (University of Texas at Dallas), A. Shirazinia (Swedbank), W. Krichene (Google Research), K.-Y. Liang (Scania)

## Student Supervision

<b>The University of Melbourne</b>	<b>Australia</b>
<i>Z. Armaghan, PhD, co-supervisor (with M. Cantoni)</i>	Mar 2017–Present
<i>A. Saberi, PhD, co-supervisor (with G. Nair)</i>	Nov 2017–Present
<i>M. Fasani, G. Maronati, Exchange MSc, co-supervisor (with M. Cantoni)</i>	Nov 2014–June 2015
<i>C. D. Perera, J. Tran, K. Ngo, Honour, co-supervisor (with M. Cantoni, I. Shames)</i>	Mar–Nov 2018
<i>Q. Li, Z. Li, B. Wu, Honour, co-supervisor (with M. Cantoni, I. Shames)</i>	Aug 2017–June 2018
<i>S. Chen, X. Xiang, W. Gao, Honour, co-supervisor (with M. Cantoni, I. Shames)</i>	Aug 2017–June 2018
<i>A. Shah, F. Hu, K. Zhong, Honour, co-supervisor (with M. Cantoni, I. Shames)</i>	Aug 2017–June 2018
<i>X. Wang, L. Zou, Z. Sun, Honour, co-supervisor (with M. Cantoni)</i>	Aug 2016–June 2017
<i>P. Zhang, C. Liang, X. Yu, Honour, co-supervisor (with I. Shames)</i>	Aug 2016–June 2017
<i>W. Yuhan, Y. Wentao, Z. Qin, Honour, co-supervisor (with I. Shames)</i>	Aug 2015–June 2016
<i>T. Martin, B. Malandra, Honour, co-supervisor (with I. Shames)</i>	Mar–Nov 2015

<i>T. Mcnicol, N. Batterham, Honour, co-supervisor (with I. Shames)</i>	<i>Mar–Nov 2015</i>
<b>CSIRO's Data61</b>	<b>Australia</b>
<i>S. Mahjabin, MRes (Macquarie University), co-supervisor (with D. Vatsalan, D. Kaafar)</i>	<i>Jan 2019–Dec 2019</i>
<i>N. Wu, MRes (Macquarie University), co-supervisor (with D. Smith, D. Kaafar)</i>	<i>June 2018–May 2019</i>
<i>N. U. Sheikh, MRes (Macquarie University), co-supervisor (with H. J. Asghar, D. Kaafar)</i>	<i>June 2018–May 2019</i>
<b>KTH Royal Institute of Technology</b>	<b>Sweden</b>
<i>M. Biel, BSc, co-supervisor (with H. Sandberg)</i>	<i>June–Aug 2014</i>
<i>A. P. Tellez, J. Roth, E. Hallqvist, S. Håkansson, BSc, supervisor</i>	<i>Jan–May 2013</i>
<i>E. Ehrlin, M. Törnqvist, BSc, supervisor</i>	<i>Jan–May 2012</i>
<i>C. Olsson, L. Brandt, T. Axelsson, BSc, supervisor</i>	<i>Jan–May 2012</i>
<i>I. Tjernberg, J. Lindberg, K. Hansson, BSc, co-supervisor (with J. Araujo)</i>	<i>Jan–May 2011</i>

## Professional Activities

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### Chairing and Organisation of Technical Meetings

- Associate Editor IET Smart Grid
- Associate Editor for Results in Control and Optimization
- TPC Chair for Workshop on Machine Learning Security and Privacy: Experiences and Applications co-located with the IEEE International Conference on Mobile Ad-Hoc and Smart Systems (IEEE MASS 2019)
- TPC for the IEEE International Workshop on Artificial Intelligence for Mobile (AI4Mobile'19) co-located with IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2019)
- Co-organiser, "Encrypted Control and Optimization", IEEE Conference on Decision and Control (CDC 2018)
- Co-organiser, "Security & Privacy of Cyber-Physical Systems", American Control Conference (ACC 2018)
- IPC at the 12th International UKACC Conference on Control (Control 2018)
- Co-chair, "Estimation I", IEEE Conference on Decision and Control (CDC 2016)
- Co-chair, "Distributed Systems", Australian Control Conference (AuCC 2016)
- Co-chair, "Emerging Applications", IEEE Multi-Conference on Systems and Control (MSC 2015)
- Organiser/chair, "Privacy in Complex Systems", IEEE Conference on Decision and Control (CDC 2015)
- Co-chair, "Decentralized Control II", Mediterranean Conference on Control and Automation (MED 2011)
- Co-organiser of NetCon internal workshop, Feb 11, 2011, Stockholm, Sweden

### Reviews

- **Journals:** IEEE Transactions on Information Theory, IEEE Control Systems, IEEE Transactions on Network Science & Engineering, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Aerospace and Electronic Systems, IEEE Control Systems Letters, IEEE Transactions on Signal Processing, IEEE Transactions on Control Systems Technology, Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Smart Grid, IET Smart Grid, IEEE/ASME Transactions on Mechatronics, Transportation Research Part B Methodological, Control Engineering Practice, European Journal of Control, IEEE Transactions on Control of Network Systems, IET Control Theory & Applications, IEEE Transactions on Intelligent Transportation Systems, SIAM Journal on Control and Optimization, Nonlinear Analysis: Hybrid Systems, International Journal of Robust and Nonlinear Control, IEEE Journal on Selected Areas in Communications, Optimal Control, Applications and Methods, Information Sciences, International Journal of Systems Science.
- **Conferences:** IEEE International Symposium on Information Theory (ISIT), IEEE International Conference on Network Protocols, American Control Conference, IEEE Conference on Decision and Control, European Control Conference, IEEE Intelligent Vehicles Symposium, IEEE Multi-Conference on Systems and Control, NecSys IFAC Workshop on Distributed Estimation and Control in Networked Systems, SIAM Conference on Control and Its Applications, IFAC World Congress, Mathematical Theory of Networks and Systems, Australian Control Conference, IEEE International Conference on Automation Science and Engineering, Mediterranean Conference on Control and Automation, Indian Control Conference.

### Membership of Committees and Professional Societies

- Senior Member of IEEE.

## References

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Available upon request.