Enrico Lovisari

Curriculum Vitae

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Education

Jan. 2009– Dec. 2011	**PhD in Information Engineering**, *University of Padova*, Italy. Ph.D. in Information Engineering, under the scientific supervision of prof. Sandro Zampieri
Oct. 2006– Oct. 2008	**Master of Science in Controls Engineering**, *University of Padova*, Italy, *Grade:* 110/110 summa cum laude.
Oct. 2003– Oct. 2006	**Bachelor of Science in Controls Engineering**, *University of Padova*, Italy, *Grade:*110/110 summa cum laude.

Experience

Sept. 2012 – present	**Post-doc researcher**, *Department of Automatic Control, LTH, University of Lund*, Lund, Sweden.
May – Aug. 2012	**Post-doc researcher**, *Department of Information Engineering, University of Padova*, Padova, Italy.

Research Interests

Current	Analysis and Control Synthesis in Transportation Networks.
	Synchronization of Heterogeneous Systems in Multi-Agent Networks.
	Estimation and control in large scale multi–agent systems.
	Distributed Calibration Algorithms for networks of cameras.
Past	Graph theory and its application to distributed algorithms.

Projects

Past	Involved in the FP7 European Projects *FeedNetBack* and *HYCON2*. www.feednetback.eu, http://www.hycon2.eu/

Theses

PhD thesis	*Synchronization algorithms for multi-agent systems: Analysis, Synthesis and Applications*
Supervisor	Sandro Zampieri
Description	The thesis addresses the problem of synchronization in multi–agent systems. In the first part, I study the performance of the linear consensus algorithm, with particular focus on the class of geometric graphs. In the second part, I present novel results for robust synchronization in higher–order multi-agent networks. Finally, the developed theory is applied to two important applicative scenarios, clocks synchronization and cameras calibration.

Master thesis	*Consensus-based algorithms for distributed estimation over sensor networks*
Supervisor	Sandro Zampieri
Description	The thesis studies a Kalman-like distributed estimation algorithm based on the linear consensus algorithm, and the relative distributed observer and control scheme.

Teaching Experiences

Apr.-May 2013	**Co-organizer**, *PhD course "Distributed Control"*, Department of Automatic Control, LTH, lecturer: prof. Anders Rantzer.
Oct. 2008 - Jan. 2009	**Teaching Assistant**, *in 'Tutor Junior' program, University of Padova*. Analisi 1 (Calculus 1) – 20 hours.
Oct. 2007 - Jan. 2008	**Teaching Assistant**, *in 'Tutor Junior' program, University of Padova*. Analisi 1 (Calculus 1) – 20 hours.
Jan. 2007 - May 2008	**Teaching Assistant**, *in 'Tutor Junior' program, University of Padova*. Algebra lineare e geometria (Linear Algebra and Geometry) – 20 hours.

Scientific Experiences

Feb. 2010, Sep. 2010–Feb. 2011	**Research Internship**, *Royal Institute of Technology - KTH, Stockholm*, Sweden. 20 days + 5 months, visiting student under the scientific supervision of prof. Ulf T. Jönsson with research theme on Synchronization of Heterogeneous Systems in a Multi-Agent Networks.
July 7-9, 2009	**Summer School**. PhD school "Networked Control Systems", Siena, Italy
June 22-25, 2009	**Summer School**. PhD school "Mathematical Foundations of Complex Networked Information Systems", Verrés, AO, Italy
Feb. 08-12, 2010	**PhD Course**. Intensive Course on Distributed Optimization, KTH, Stockholm, Sweden.
Reviewer	Reviewer for the Scientific Journals 'System and Control Letters', 'Transactions on Automatic Control', 'Automatica', 'Transactions on Control of Network Systems'.

Scientific Communications

Mar. 27, 2014	**Seminar**, *Department of Automatic Control, LTH*, Lund, Sweden. Talk: 'A short survey on traffic models and some open problems'.
May 17, 2013	**Seminar**, *Department of Automatic Control, LTH*, Lund, Sweden. Talk: 'Analysis and synthesis for monotone traffic models'.
Feb. 21, 2012	**Seminar**, *Department of Automatic Control, LTH*, Lund, Sweden. Talk: 'Synchronization in Multi-Agent Systems: analysis and applications'.
Dec. 12-15, 2011	**Conference CDC'11**, *Orlando*, Florida. Talk: 'A Framework for Robust Synchronization in Heterogeneous Multi-Agent Networks'.

Dec. 3, 2010	**Seminar**, *Division of Optimization and System Theory, Department of Mathematics, KTH*, Stockholm, Sweden.
	Talk: 'Performance metrics in the consensus problem and design of communication topology'.
Sep. 15-16, 2010	**Workshop**, *FeedNetBack Project Young Researchers Workshop*, Annecy, France.
	Talk: 'A Nyquist criterion for synchronization in networks of heterogeneous linear systems'.
Sep. 13-14, 2010	**Conference NecSys'10**, Annecy, France.
	Talk: 'A Nyquist criterion for synchronization in networks of heterogeneous linear systems'.
July 5-10, 2010	**Conference MTNS'10**, Budapest, Hungary.
	Talk: 'A Resistance-Based performance analysis for consensus algorithms'.
July 14-15, 2010	**Workshop'Algorithms and dynamics over networks'**, *Department of Mathematics, Politecnico di Torino*, Turin, Italy.
	Talk: 'A Resistance-Based performance analysis for consensus algorithms'.

Other Relevant Experiences

| Mar. 2009– Mar. 2011 | **Institutional positions**, *Department of Information Engineering*. |
| | Ph.D. student representative in the Department Council Board. |

Languages

Italian	**Mother Tongue**
English	**Fluent**
Swedish	**SFI D level**

Technical Skills

Operating Systems	Microsoft Windows, Linux (Ubuntu)
Programming	Advanced knowledge of Matlab and Simulink
	Basic knowledge of Java and C
Typesetting	Advanced knowledge of LaTeX

Publications

Journal papers

J3] E. Lovisari and C.Y. Kao, Synchronization of Networks of Heterogeneous Agents. *IEEE Transactions on Automatic Control.* To appear.

J2] E. Lovisari and S. Zampieri, Performance metrics in the average consensus problem: a tutorial. *Annual Reviews in Control.* Vol. 36, no. 1, April 2012, pp 26-41.

J1] E. Lovisari, F. Garin and S. Zampieri, Resistance-based performance analysis of the consensus algorithm over geometric graphs. *SIAM Journal on Control and Optimization*, vol. 51, no. 5, pp. 3918-3945, 2013.

Journal Papers (submitted)

PR1] G. Como, E. Lovisari, K. Savla, Throughput optimality and overload behavior of dynamical flow networks under monotone distributed routing. *IEEE Transactions on Control of Network Systems.*

Submitted.

PR2] S.-Z. Khong, E. Lovisari and A. Rantzer, A unifying framework for robust synchronisation of heterogeneous networks via integral quadratic constraints. *IEEE Transactions on Automatic Control.* Submitted.

Conference Papers

C13] K. Savla, E. Lovisari and G. Como, On maximally stabilizing adaptive signal control for urban traffic networks under multi-movement phase architecture. *19th IFAC World Congress*, Cape Town, South Africa, Aug. 24-29, 2014.

C12] S.Z. Khong, E. Lovisari and A. Rantzer, Consensus analysis via integral quadratic constraints. *21th International Symposium on Mathematical Theory of Networks and Systems, MTNS'14*, Groningen, The Netherlands, July 7-11, 2014.

C11] S.Z. Khong and E. Lovisari, Robust Synchronisation of Heterogeneous Networks via Integral Quadratic Constraints. *22nd Mediterranean Conference on Control & Automation.* Palermo, Italy, June 16-19, 2014.

IC10] K. Savla, E. Lovisari and G. Como, On maximally stabilizing adaptive traffic signal control. *51st Annual Allerton Conference on Communication, Control and Computing.* Monticello, IL, USA, Oct. 2-4, 2013. *Invited.*

C9] G. Como, E. Lovisari and K. Savla, Throughput Optimal Distributed Routing in Dynamical Flow Networks.*52th IEEE Conference on Decision and Control, CDC'13.* Florence, Italy, Dec. 10-13, 2013.

C8] R. Carli and E. Lovisari, Robust synchronization of networks of heterogeneous double-integrators with applications to wireless sensor networks.*51th IEEE Conference on Decision and Control, CDC'12.* Maui, HI, USA, Dec. 10-13, 2012.

C7] S. Bolognani, R. Carli, E. Lovisari and S. Zampieri, A randomized liner algorithm for clock synchronization in multi-agent systems. *51th IEEE Conference on Decision and Control, CDC'12.* Maui, HI, USA, Dec. 10-13, 2012.

C6] D. Borra, E. Lovisari, R. Carli, F. Fagnani and S. Zampieri, Autonomous Calibration Algorithms for Networks of Cameras. *American Control Conference, ACC'12*, Montreal, Canada, June 27-29, 2012.

C5] E. Lovisari and U.T. Jönsson, A Framework for Robust Synchronization in Heterogeneous Multi–Agent Networks. *50th IEEE Conference on Decision and Control, CDC'11*, Orlando, FL, USA, Dec. 12-15, 2011.

C4] E. Lovisari, F. Garin and S. Zampieri, A resistance-based approach to consensus algorithm performance analysis. *49h IEEE Conference on Decision and Control, CDC'10*, Atlanta, GA, USA,Dec. 15-17, 2010.

IC3] E. Lovisari and S. Zampieri, Performance metrics in the consensus problem: a Survey. *4th IFAC Symposium on System, Structure and Control, SSSC'10*, Ancona, Italy, Sept. 15-17, 2010.

C2] E. Lovisari and U.T. Jönsson, A Nyquist criterion for synchronization in networks of heterogeneous linear systems. *2nd IFAC Workshop on Distributed Estimation and Control in Networked Systems, NecSys'10*, Annecy, France, Sept. 13-14, 2010.

C1] E. Lovisari, F. Garin and S. Zampieri, A resistance-based approach to performance analysis of the consensus algorithm. *19th International Symposium on Mathematical Theory of Networks and Systems, MTNS'10*, Budapest, Hungary, July 5-9, 2010.

Conference Papers (submitted)

CPR2] G. Nilsson, G. Como, and E. Lovisari, On Resilience of Multicommodity Dynamical Flow Networks. *53th IEEE Conference on Decision and Control, CDC'14*. Submitted.

CPR1] E. Lovisari, G. Como, and K. Savla, Stability of monotone dynamical flow networks. *53th IEEE Conference on Decision and Control, CDC'14*. Submitted.