

Reza Olfati-Saber

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Education Ph.D. in Electrical Eng. and Computer Science, Massachusetts Institute of Technology, February 2001, Cambridge, MA.

S.M. in Electrical Eng. and Computer Science, Massachusetts Institute of Technology, February 1997, Cambridge, MA.

B.S. in Electrical Engineering, Sharif University of Technology, June 1994, Tehran, Iran.

Experience DARTMOUTH COLLEGE Hanover, NH
Assistant Professor of Engineering, Thayer School of Engineering, Sep. 2005-present.

UNIVERSITY OF CALIFORNIA, LOS ANGELES (UCLA) Los Angeles, CA
Visiting Scientist, Mechanical and Aerospace Engineering Department, Oct. 2004–Aug. 2005.

CALIFORNIA INSTITUTE OF TECHNOLOGY (CALTECH) Pasadena, CA
Postdoctoral Scholar, Control and Dynamical Systems, Division of Engineering and Applied Science, Mar. 2001–Sep. 2004.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) Cambridge, MA
Research Assistant, Laboratory for Information and Decision Systems (LIDS), Feb. 1997–Jan. 2001.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) Cambridge, MA
Research Assistant, Laboratory for Electromagnetic and Electronic Systems (LEES), Nov. 1995–Jan. 1997.

IBM T. J. WATSON RESEARCH CENTER Yorktown, NY
Intern, Department of Speech Recognition, Summer 1996.

Honors and Awards

2008. NSF CAREER Award.

2008. Invited Plenary Speaker¹ of the *27th Benelux Conference on Systems and Control* held in Heeze, the Netherlands, March 2008.

2009. Plenary Speaker, *Dutch Institute of Systems and Control Summer Graduate School*, the Netherlands, June 2009.

1990. Ranked 1st in the nation-wide university entrance examination of quota 2 in Iran among 200,000 students.

¹I had to later decline this invitation due to a delay in receiving my permanent resident card.

Activities

1. Member of IEEE, ASME, and the Sigma Xi scientific society.
2. Organizer, *Complex Systems Symposium* at the Thayer School at Dartmouth.
3. Member of Organizing Committee, *46th IEEE Conference on Decision and Control, New Orleans, LA, December 2007*.
4. Member of the Program Committee of the 1st, 2nd, and 3rd International Conference on Robot Communication and Coordination (RoboComm 2007-2009).
5. NSF Panel Reviewer, June 2007.
6. NSF Panel Reviewer, April 2008.
7. Chairman and Organizer, Invited Session on “Distributed Estimation in Sensor Networks”, 45th IEEE Conference on Decision and Control, San Diego, CA, Dec. 2006.
8. Reviewing articles for several conferences and the following Journals:
 - Automatica*
 - IEEE Trans. on Automatic Control*
 - IEEE Trans. on Signal Processing*
 - IEEE Trans. on Robotics and Automation*
 - IEEE Trans. on Systems, Man, and Cybernetics*
 - IEEE Trans. on Control Systems Technology*
 - ASME Journal of Dynamic Systems, Measurements, and Control*
 - Physics Letters A*
 - SIAM Journal on Control and Optimization*
 - Systems & Control Letters*
 - Int. J. of Information Fusion*
 - Int. J. of Control*
 - Int. J. of Robust and Nonlinear Control*
 - Int. J. of Mechatronics*
 - Artificial Life*

Selected Invited Talks

1. *SASO '08 Invited Tutorial (4 hours)*, “Consensus-based Design of Self-Organizing Multi-Agent Systems,” Venice, Italy, Oct. 20, 2008.
2. *Harvard University*, “Design of Self-Organizing Networked Systems,” Sep. 27, 2007.
3. *Boston University*, “Distributed Data Fusion in Networked Sensing Systems,” Dec. 8, 2006.
4. *Massachusetts Institute of Technology*, “Data Fusion in Sensor Networks: A Consensus-based Kalman Filtering Approach,” Oct. 3, 2006.
5. *University of California, Los Angeles*, “Evolutionary Dynamics of Language,” June 5, 2006.
6. *University of Notre Dame*, “Belief Consensus and Distributed Hypothesis Testing in Sensor Networks,” Oct. 17, 2005.
7. *Stanford University*, “Flocking: Cooperative Autonomy for Multi-Vehicle Systems,” June 16, 2003.
8. *Cambridge University, UK*, “Flocking with Obstacle Avoidance,” Nov. 25, 2003.
9. *Princeton University*, “Distributed Cooperative Control of Multi-Vehicle Systems and Rigidity-based Task Specification,” Jan. 17, 2003.
10. *University of California, Los Angeles*, “Distributed Control of Multi-Vehicle Formations using Potential Functions,” Nov. 19, 2001.

Publications Books:

1. **R. Olfati-Saber**, *Networked Multi-Agent Systems: Distributed Algorithms for Coordination and Information Fusion*, Springer, August 2009 (under preparation).

Journal Papers:

1. **R. Olfati-Saber**, “Distributed Kalman Filtering in Sensor Networks,” *IEEE Trans. on Automatic Control* (to be submitted, Feb. 2009).
2. **R. Olfati-Saber**, A. Fax, and R. M. Murray, “Consensus and Cooperation in Networked Multi-Agent Systems,” *Proceedings of the IEEE*, vol. 95, no. 1, pp. 215–233, Jan. 2007.
3. **R. Olfati-Saber**, “Flocking for Multi-Agent Dynamic Systems: Algorithms and Theory,” *IEEE Trans. on Automatic Control*, vol. 51, no. 3, pp. 401–420, Mar. 2006.
4. **R. Olfati-Saber** and R. M. Murray, “Consensus Problems for Networks of Dynamic Agents with Switching Topology and Time-delays,” *IEEE Trans. on Automatic Control*, vol. 49, pp. 1520–1533, Sep., 2004.
5. **R. Olfati-Saber**, “Global Configuration Stabilization of the VTOL Aircraft with Strong Input Coupling,” *IEEE Trans. on Automatic Control*, vol. 47, pp. 1949–1952, Nov. 2002.
6. **R. Olfati-Saber**, “Normal Forms for Underactuated Mechanical Systems with Symmetry,” *IEEE Trans. on Automatic Control*, vol. 47, pp. 305–308, Feb. 2002.

Book Chapters:

1. **R. Olfati-Saber**, “Design of Behavior of Swarms: From Flocking to Data Fusion using Microfilter Networks,” In J. S. Shamma (Ed): *Cooperative Control of Distributed Multi-Agent Systems*, John Wiley & Sons, 2007.
2. **R. Olfati-Saber**, “Distributed Kalman Filtering and Sensor Fusion in Sensor Networks,” In P. J. Antsaklis and P. Tabuada (Eds): *Network Embedded Sensing and Control*, LNCIS 331, pp. 157–167, Springer-Verlag, 2006.
3. **R. Olfati-Saber**, E. Franco, E. Frazzoli, and J. S. Shamma, “Belief Consensus and Distributed Hypothesis Testing in Sensor Networks,” In P. J. Antsaklis and P. Tabuada (Eds): *Network Embedded Sensing and Control*, LNCIS 331, pp. 169–182, Springer-Verlag, 2006.

Conference Papers:

1. N. F. Sandell and **R. Olfati-Saber**, “Distributed Data Association for Multi-target Tracking in Sensor Networks,” *Proceedings of the 47th IEEE Conference on Decision and Control, Cancun, Mexico, Dec. 2008*.
2. **R. Olfati-Saber** and N. F. Sandell, “Distributed Tracking in Sensor Networks with Limited Sensing Range,” *Proceedings of the 2008 American Control Conference, Seattle, WA, June 2008*.
3. **R. Olfati-Saber**, “Evolutionary Dynamics of Behavior in Social Networks,” *Proc. of the 46th IEEE Conference on Decision and Control, New Orleans, LA, Dec. 2007*.
4. **R. Olfati-Saber**, “Distributed Kalman Filtering in Sensor Networks,” *Proc. of the 46th IEEE Conference on Decision and Control, New Orleans, LA, Dec. 2007*.
5. **R. Olfati-Saber**, “Distributed Tracking for Mobile Sensor Networks with Information-Driven Mobility,” *Proceedings of the 2007 American Control Conference*, pp. 4606–4612, New York, NY, July 2007.

6. **R. Olfati-Saber**, "Algebraic Connectivity Ratio of Ramanujan Graphs," *Proceedings of the 2007 American Control Conference*, pp. 4619–4624, New York, NY, July 2007.
7. **R. Olfati-Saber**, "Swarms on Sphere: A Programmable Swarm with Synchronous Behaviors like Oscillator Networks," *Proceedings of the 45th IEEE Conference on Decision and Control*, San Diego, CA, Dec. 2006.
8. E. Franco, **R. Olfati-Saber**, T. Parisini, and M. M. Polycarpou, "Distributed Fault Diagnosis using Sensor Networks and Consensus-based Filters," *Proceedings of the 45th IEEE Conference on Decision and Control*, San Diego, CA, Dec. 2006.
9. **R. Olfati-Saber**, "Distributed Kalman Filter with Embedded Consensus Filters," *Proc. of the joint IEEE Conf. on Decision and Control and the European Control Conf.*, Seville, Spain, Dec. 2005.
10. **R. Olfati-Saber** and J. S. Shamma, "Consensus Filters for Sensor Networks and Distributed Sensor Fusion," *Proc. of the joint IEEE Conf. on Decision and Control and the European Control Conf.*, Seville, Spain, Dec. 2005.
11. **R. Olfati-Saber**, "Ultrafast Consensus in Small-World Networks," *Proceedings of the 2005 American Control Conference*, June 2005.
12. D. P. Spanos, **R. Olfati-Saber**, and R. M. Murray, "Dynamic Consensus on Mobile Networks," *The 16th IFAC World Congress*, Prague, Czech, 2005.
13. D. P. Spanos, **R. Olfati-Saber**, and R. M. Murray, "Distributed Sensor Fusion using Dynamic Consensus," *The 16th IFAC World Congress*, Prague, Czech, 2005.
14. D. P. Spanos, **R. Olfati-Saber**, and R. M. Murray, "Approximate Distributed Kalman Filtering in Sensor Networks with Quantifiable Performance," *Fourth International Symposium on Information Processing in Sensor Networks, 2005 (IPSN '05)*, Los Angeles, CA, April 2005.
15. R. M. Murray, W. B. Dunbar, **R. Olfati-Saber**, and L. B. Cremean, "Controller Synthesis for Constrained Flight Systems via Receding Horizon Optimization," *2nd AIAA "Unmanned Unlimited" Systems, Technologies, and Operations-Aerospace, Land, and Sea Conference and Workshop & Exhibits*, 2004.
16. **R. O. Saber** and R. M. Murray, "Flocking with Obstacle Avoidance: Cooperation with Limited Communication in Mobile Networks," *Proc. of the 42nd IEEE Conf. on Decision and Control*, Dec. 2003.
17. **R. O. Saber** and R. M. Murray, "Agreement Problems in Networks with Directed Graphs and Switching Topology," *Proc. of the 42nd IEEE Conf. on Decision and Control*, Dec 2003.
18. D. E. Chang, S. Shadden, J. Marsden, **R. Olfati-Saber**, "Collision Avoidance for Multiple Agent Systems," *Proc. of the 42nd IEEE Conf. on Decision and Control*, Dec 2003.
19. W. B. Dunbar, **R. Olfati-Saber**, and R. M. Murray, "Nonlinear and Cooperative Control of Multiple Hovercraft with Input Constraints," *Proc. of the European Control Conference*, Cambridge, UK, 2003.
20. **R. O. Saber** and R. M. Murray, "Consensus Protocols for Networks of Dynamic Agents," *Proc. of the 2003 American Control Conference*, June 2003.
21. **R. O. Saber**, W. B. Dunbar, and R. M. Murray, "Cooperative Control of Multi-vehicle Systems using Cost Graphs and Optimization," *Proc. of the 2003 American Control Conference*, June 2003.
22. **R. Olfati-Saber** and R. M. Murray, "Graph Rigidity and Distributed Formation Stabilization of Multi-vehicle Systems," *Proc. of the 41st IEEE Conf. on Decision and Control*, Las Vegas, Nevada, Dec 2002.

23. **R. Olfati-Saber** and R. M. Murray, "Distributed Structural Stability and Tracking for Formations of Dynamic Multi-agents," *Proc. of the 41st IEEE Conf. on Decision and Control, Las Vegas, Nevada, Dec 2002*.
24. **R. Olfati-Saber** and R. M. Murray, "Distributed Cooperative Control of Multiple Vehicle Formations Using Structural Potential Functions," *Proc. of the 15th IFAC World Congress, Barcelona, Spain, July 2002*.
25. **R. Olfati-Saber**, "Near Identity Diffeomorphism and Exponential ϵ -Tracking and ϵ -Stabilization of First-Order Nonholonomic $SE(2)$ Vehicles," *Proc. of the 2002 American Control Conference, Anchorage, Alaska, May 2002*.
26. **R. Olfati-Saber**, "Exponential ϵ -Tracking and ϵ -Stabilization of Second-Order Nonholonomic $SE(2)$ Vehicles Using Dynamic State Feedback," *Proc. of the 2002 American Control Conference, Anchorage, Alaska, May 2002*.
27. **R. Olfati-Saber**, "Nonlinear Control and Reduction of Underactuated Systems with Symmetry I: Actuated Shape Variables Case," *Proc. of the 40th IEEE Conf. on Decision and Control, Orlando, FL, Dec 2001*.
28. **R. Olfati-Saber**, "Nonlinear Control and Reduction of Underactuated Systems with Symmetry II: Unactuated Shape Variables Case," *Proc. of the 40th IEEE Conf. on Decision and Control, Orlando, FL, Dec 2001*.
29. **R. Olfati-Saber**, "Nonlinear Control and Reduction of Underactuated Systems with Symmetry III: Input Coupling Case," *Proc. of the 40th IEEE Conf. on Decision and Control, Orlando, FL, Dec 2001*.
30. **R. Olfati-Saber**, "Global Stabilization of a Flat Underactuated System: the Inertia-Wheel Pendulum," *Proc. of the 40th IEEE Conf. on Decision and Control, Orlando, FL, Dec 2001*.
31. **R. Olfati-Saber**, "Cascade Normal Forms for Underactuated Mechanical Systems," *Proc. of the 39th IEEE Conf. on Decision and Control, Sydney, Australia, Dec 2000*.
32. **R. Olfati-Saber**, "Trajectory Tracking for a Flexible One-link Robot using a Nonlinear Noncollocated Output," *Proc. of the 39th IEEE Conf. on Decision and Control, Sydney, Australia, Dec 2000*.
33. **R. Olfati-Saber**, "Fixed point controllers and stabilization of the cart-pole system and the rotating pendulum," *Proc. of the 38th IEEE Conf. on Decision and Control, Dec 1999*.
34. **R. Olfati-Saber** and A. Megretski, "Controller Design for a Class of Underactuated Nonlinear Systems," *Proc. of the 37th IEEE Conf. on Decision and Control, Dec 1998*.
35. **R. Olfati-Saber** and A. Megretski, "Controller Design for the Beam-and-Ball System," *Proc. of the 37th IEEE Conf. on Decision and Control, Dec 1998*.

Highly Cited Publications (selected)

1. R. Olfati-Saber and R. M. Murray, "Consensus Problems for Networks of Dynamic Agents with Switching Topology and Time-delays," *IEEE Trans. on Automatic Control, vol. 49, pp. 1520-1533, Sep., 2004*. Citation on **Scholar: 1001 times and ISI: 584 times**.
2. R. Olfati-Saber, "Flocking for Multi-Agent Dynamic Systems: Algorithms and Theory," *IEEE Trans. on Automatic Control, vol. 51, no. 3, pp. 401-420, Mar. 2006*. Citation on **Scholar: 409 times and ISI: 190 times**.

3. R. Olfati-Saber, A. Fax, and R. M. Murray, "Consensus and Cooperation in Networked Multi-Agent Systems," *Proc. of the IEEE*, vol. 95, no. 1, pp. 215–233, Jan. 2007. Citation on **Scholar: 405 times and ISI: 129 times.**
4. R. Olfati-Saber and R. M. Murray, "Distributed Cooperative Control of Multiple Vehicle Formations Using Structural Potential Functions," *Proc. of the 15th IFAC World Congress, Barcelona, Spain, July 2002*. Citation on **Scholar: 201 times.**
5. R. Olfati-Saber and R. M. Murray, "Graph Rigidity and Distributed Formation Stabilization of Multi-vehicle Systems," *Proc. of the 41st IEEE Conf. on Decision and Control, Las Vegas, Nevada, Dec 2002*. Citation on **Scholar: 128 times.**
6. R. Olfati-Saber, "Distributed Kalman Filter with Embedded Consensus Filters," *Proc. of the joint IEEE Conf. on Decision and Control and the European Control Conf., Seville, Spain, Dec. 2005*. Citation on **Scholar: 116 times.**
7. R. Olfati-Saber, "Nonlinear Control of Underactuated Mechanical Systems with Application to Robotics and Aerospace Vehicles," **PhD Thesis**, Massachusetts Institute of Technology, Cambridge, MA 02139, Feb 2001. Citation on **Scholar: 97 times.**
8. R. Olfati-Saber, "Ultrafast Consensus in Small-World Networks," *Proceedings of the 2005 American Control Conference, June 2005*. Citation on **Scholar: 75 times and ISI: 26 times.**
9. R. Olfati-Saber, "Global Configuration Stabilization for the VTOL aircraft with Strong Input Coupling," *IEEE Trans. on Automatic Control*, vol. 47, no. 11, pp. 1949–1952, Nov. 2002. Citation on **Scholar: 54 times and ISI: 24 times.**
10. R. Olfati-Saber, "Normal Forms for Underactuated Mechanical Systems with Symmetry," *IEEE Trans. on Automatic Control*, vol. 47, no. 2, pp. 305–308, Feb. 2002. Citation on **Scholar: 33 times and ISI: 20 times.**