PUBLICATIONS

BOOKS

- W.M. Haddad and S.G. Nersesov, Stability and Control of Large-Scale Dynamical Systems: A Vector Dissipative Systems Approach, Princeton, NJ: Princeton University Press, 2011.
- W.M. Haddad, V. Chellaboina, and S.G. Nersesov, *Impulsive and Hybrid Dynamical Systems: Stability, Dissipativity, and Control*, Princeton, NJ: Princeton University Press, 2006.
- W.M. Haddad, V. Chellaboina, and S.G. Nersesov, *Thermodynamics: A Dynamical Systems Approach*, Princeton, NJ: Princeton University Press, 2005.

BOOK CHAPTERS

- W. M. Haddad, S. G. Nersesov, and V. Chellaboina, "Heat Flow, Work Energy, Chemical Reactions, and Thermodynamics: A Dynamical Systems Perspective," in *Thermodynamics*, T. Mizutani, Ed., InTech, pp. 51-72, 2011.
- W.M. Haddad, S. G. Nersesov, and L. Du, "Finite-Time Stability for Time-Varying Nonlinear Dynamical Systems," in: *Advances in Nonlinear Analysis: Theory Methods and Applications*, S. Sivasundaram, J. V. Devi, Z. Drici, and F. Mcrae, Eds., Cambridge Scientific Publishers, pp. 139-150, 2009.
- W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Energy-Based Control for Hybrid Port-Controlled Hamiltonian Systems," *Proceedings of Nonlinear Problems in Aviation and Aerospace*, S. Sivasundaram, Ed., pp. 178-186, Cambridge, UK, European Conference Publications, 2002.

JOURNAL PAPERS

- 1. M. Ghasemi, S.G. Nersesov, G. Clayton, H. Ashrafiuon, "Sliding Mode Coordination Control for Multiagent Systems with Underactuated Agent Dynamics," *International Journal of Control*, in press.
- S.G. Nersesov, V. Deshmukh, and M. Ghasemi, "Output Reversibility in Linear Discrete-Time Dynamical Systems," *Journal of the Franklin Institute*, vol. 351, pp. 4479–4494, 2014.
- 3. W.M. Haddad, S.G. Nersesov, Q. Hui, M. Ghasemi, "Formation Control Protocols for Nonlinear Dynamical Systems via Hybrid Stabilization of Sets," *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 136, p. 051020, 2014.
- 4. M. Ghasemi, S.G. Nersesov, and G. Clayton, "Finite-Time Tracking using Sliding Mode Control," *Journal of the Franklin Institute*, vol. 351(5), pp. 2966–2990, 2014.

- 5. M. Ghasemi and S.G. Nersesov, "Finite-Time Coordination in Multiagent Systems using Sliding Mode Control Approach," *Automatica*, vol. 50, pp. 1209-1216, 2014.
- S.G. Nersesov, H. Ashrafiuon, and P. Ghorbanian, "On Estimation of the Domain of Attraction for Sliding Mode Control of Underactuated Nonlinear Systems," *International Journal of Robust and Nonlinear Control*, vol. 24, pp. 811-824, 2014.
- 7. M. Ghasemi and S. G. Nersesov, "Sliding Mode Cooperative Control for Multi-Robot Systems: A Finite-Time Approach," *Mathematical Problems in Engineering*, vol. 2013, http://dx.doi.org/10.1155/2013/450201, 2013.
- 8. A. Ajorlou, K. Moezzi, A.G. Aghdam, and S.G. Nersesov, "Two-Stage Time-Optimal Formation Reconfiguration Strategies," *Systems and Control Letters*, vol. 62, pp. 496-502, 2013.
- 9. A. Ajorlou, K. Moezzi, A.G. Aghdam, S. Tafazoli, and S.G. Nersesov, "Two-Stage Energy-Optimal Formation Reconfiguration Strategies," *Automatica*, vol. 48, no. 10, pp. 2587-2591, 2012.
- 10. K.R. Muske, H. Ashrafiuon, S.G. Nersesov, and M. Nikkhah, "Optimal Sliding Mode Cascade Control for Underactuated Nonlinear Systems," *ASME Journal of Dynamic Systems, Measurement, and Control*, vol. 134, no. 2, p. 021020, 2012.
- 11. P. Ghorbanian, S.G. Nersesov, and H. Ashrafiuon, "Obstacle Avoidance in Multi-Vehicle Coordinated Motion via Stabilization of Time-Varying Sets," *Journal of Non-linear Systems and Applications*, vol. 2011, pp. 1–8, 2011.
- 12. S.G. Nersesov, P. Ghorbanian, and A.G. Aghdam, "Stabilization of Sets with Application to Multi-Vehicle Coordinated Motion," *Automatica*, vol. 46, pp. 1419–1427, 2010.
- 13. J.M. Avis, S.G. Nersesov, and R. Nathan, "Decentralized Energy-Based Hybrid Control for the Multi-RTAC System," *Int. J. Contr.*, vol. 83, no. 8, pp. 1701–1709, 2010.
- 14. J.M. Avis, S.G. Nersesov, R. Nathan, H. Ashrafiuon, K.R. Muske, "A Comparison Study of Nonlinear Control Techniques for the RTAC System," *Nonlinear Analysis: Real World Applications*, vol. 11, pp. 2647–2658, 2010.
- 15. S.G. Nersesov, C. Nataraj, and J.M. Avis, "Design of Finite-Time Stabilizing Controllers for Nonlinear Dynamical Systems," *Int. J. of Robust and Nonlin. Contr.*, vol. 19, pp. 900–918, 2009.
- 16. S.G. Nersesov and W.M. Haddad, "Reversibility and Poincaré Recurrence in Linear Dynamical Systems," *IEEE Trans. Autom. Contr.*, vol. 53, no. 9, pp. 2160–2165, 2008.
- 17. S.G. Nersesov, W.M. Haddad, and Q. Hui, "Finite-Time Stabilization of Nonlinear Dynamical Systems via Control Vector Lyapunov Functions," *J. Franklin Inst.*, vol. 345, pp. 819–837, 2008.

- 18. S.G. Nersesov and W.M. Haddad, "Finite-Time Stabilization of Nonlinear Impulsive Dynamical Systems," *Nonlinear Analysis: Hybrid Systems*, vol. 2, pp. 832–845, 2008.
- 19. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Time-Reversal Symmetry, Poincaré Recurrence, Irreversibility, and the Entropic Arrow of Time: From Mechanics to System Thermodynamics," *Nonlinear Analysis: Real World Applications*, vol. 9, pp. 250–271, 2008.
- 20. W.M. Haddad, V. Chellaboina, Q. Hui, and S.G. Nersesov, "Energy- and Entropy-Based Stabilization for Lossless Dynamical Systems via Hybrid Controllers," *IEEE Trans. Autom. Contr.*, vol. 52, no. 9, pp. 1604-1614, 2007.
- 21. S.G. Nersesov and W.M. Haddad, "Control Vector Lyapunov Functions for Large-Scale Impulsive Dynamical Systems," *Nonlinear Analysis: Hybrid Systems*, vol. 1, pp. 223-243, 2007.
- 22. W.M. Haddad, Q. Hui, V. Chellaboina, and S.G. Nersesov, "Hybrid Decentralized Maximum Entropy Control for Large-Scale Dynamical Systems," *Nonlinear Analysis: Hybrid Systems*, vol. 1, pp. 244-263, 2007.
- 23. S.G. Nersesov and W.M. Haddad, "On the Stability and Control of Nonlinear Dynamical Systems via Vector Lyapunov Functions," *IEEE Trans. Autom. Contr.*, vol. 51, no. 2, pp. 203-215, 2006.
- 24. W.M. Haddad, N. A. Kablar, V. Chellaboina, and S.G. Nersesov, "Optimal Disturbance Rejection Control for Nonlinear Impulsive Dynamical Systems," *Nonlinear Analysis: Theory, Methods, and Applications*, vol. 62, pp. 1466-1489, 2005.
- 25. W.M. Haddad, T. Hayakawa, S.G. Nersesov, and V. Chellaboina, "Hybrid Adaptive Control for Nonlinear Impulsive Dynamical Systems," *Int. J. Adapt. Control Signal Process.*, vol. 19, pp. 445-469, 2005.
- 26. W.M. Haddad, Q. Hui, S.G. Nersesov, and V. Chellaboina, "Thermodynamic Modeling, Energy Equipartition, and Nonconservation of Entropy for Discrete-Time Dynamical Systems," *Adv. Diff. Eqs.*, vol. 2005:3, pp. 275-318, 2005.
- 27. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Vector Dissipativity Theory and Stability of Feedback Interconnections for Large-Scale Nonlinear Dynamical Systems," *Int. J. Contr.*, vol. 77, pp. 907-919, 2004.
- 28. W.M. Haddad, V. Chellaboina, Q. Hui, and S.G. Nersesov, "Vector Dissipativity Theory for Large-Scale Impulsive Dynamical Systems," *J. Math. Prob. in Engin.*, vol. 2004, no. 3, pp. 225-262, 2004.
- 29. W.M. Haddad, S.G. Nersesov, and V. Chellaboina, "A Lyapunov Function Proof of Poincaré's Theorem," *Int. J. Syst. Sci.*, vol. 35, pp. 287-292, 2004.
- 30. W.M. Haddad, Q. Hui, V. Chellaboina, and S.G. Nersesov, "Vector Dissipativity Theory for Discrete-Time Large-Scale Nonlinear Dynamical Systems," *Adv. Diff. Eqs.*, vol. 2004, no. 1, pp. 37–66, 2004.

- 31. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Thermodynamics and Large-Scale Nonlinear Dynamical Systems: A Vector Dissipative Systems Approach," *Dyn. Cont. Disc. Impl. Syst.*, vol. 11, pp. 609–649, 2004.
- 32. S.G. Nersesov, W.M. Haddad, and V. Chellaboina, "Optimal Fixed-Structure Control for Linear Nonnegative Dynamical Systems," *Int. J. Robust Nonlin. Contr.*, vol. 14, pp. 487–511, 2004.
- 33. A. Roup, D.S. Bernstein, S.G. Nersesov, W.M. Haddad, and V. Chellaboina, "Limit Cycle Analysis of the Verge and Foliot Clock Escapement using Impulsive Differential Equations and Poincaré Maps," *Int. J. Control*, vol. 76, pp. 1685–1698, 2003.
- 34. W.M. Haddad, S.G. Nersesov, and V. Chellaboina, "Energy-Based Control for Hybrid Port-Controlled Hamiltonian Systems," *Automatica*, vol. 39, pp. 1425–1435, 2003.
- 35. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Hybrid Nonnegative and Compartmental Dynamical Systems," *J. Math. Prob. Engin.*, vol.8(6), pp. 493-515, 2002.
- 36. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "A Unification Between Partial Stability of State-Dependent Impulsive Systems and Stability Theory for Time-Dependent Impulsive Systems," *International Journal of Hybrid Systems*, vol. 2, no. 2, pp. 155–168, 2002.
- 37. S.G. Nersesov, V. Chellaboina, and W.M. Haddad, "A Generalization of Poincaré's Theorem to Hybrid and Impulsive Dynamical Systems," *International Journal of Hybrid Systems*, vol. 2, no. 1, pp. 39–55, 2002.
- 38. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "On the Equivalence Between Dissipativity and Optimality of Nonlinear Hybrid Controllers," *International Journal of Hybrid Systems*, vol. 1, no. 1, pp. 51–66, 2001.

CONFERENCE PAPERS

- 1. M. Ghasemi, S.G. Nersesov, G.M. Clayton, and H. Ashrafiuon, "Coordination Control with Collision Avoidance for Multiagent Systems with Underactuated Agent Dynamics," *Proc. Int. Conf. Contr.*, *Dyn. Sys.*, and *Robotics*, Ottawa, Canada, May 2014, to appear.
- 2. W.M. Haddad, S.G. Nersesov, Q. Hui, and M. Ghasemi, "Flocking and Rendezvous Control Protocols for Nonlinear Dynamical Systems via Hybrid Stabilization of Sets," *Proc. IEEE Conf. Dec. Contr.*, pp. 2151–2156, Florence, Italy, December 2013.
- 3. M. Ghasemi and S.G. Nersesov, "Sliding Mode Coordination Control Design for Multiagent Systems," *Proc. ASME Dyn. Sys. and Contr. Conf.*, DSCC2013-3902, Palo Alto, CA, October 2013.
- 4. S.G. Nersesov, V. Deshmukh, and M. Ghasemi, "Output Reversibility in Linear Discrete-Time Dynamical Systems," *Proc. ASME Dyn. Sys. and Contr. Conf.*, DSCC2013-3710, Palo Alto, CA, October 2013.
- W.M. Haddad, S.G. Nersesov, and M. Ghasemi, "Formation Control Protocols for Nonlinear Dynamical Systems via Hybrid Stabilization of Sets," *Proc. European Contr.* Conf., pp. 3149–3154, Zurich, Switzerland, July 2013.
- M. Ghasemi and S.G. Nersesov, "Finite-Time Coordination in Multiagent Systems using Sliding Mode Control Approach," Proc. Amer. Contr. Conf., pp. 2053–2058, Washington, DC, June 2013.
- 7. S.G. Nersesov, W.M. Haddad, and D.S. Bernstein, "Poincaré Recurrence and Output Reversibility in Linear Dynamical Systems," *Proc. IEEE Conf. Dec. Contr.*, pp. 2587–2592, Maui, HI, December 2012.
- 8. S.G. Nersesov and M. Ghasemi, "Finite-Time Tracking for Euler-Lagrange Systems using Sliding Mode Control," *Proc. Dyn. Sys. and Contr. Conf.*, DSCC2012-MOVIC2012-8665, Fort Lauderdale, FL, October 2012.
- 9. P. Ghorbanian, S.G. Nersesov, and H. Ashrafiuon, "Optimal Sliding Mode Control for a Class of Underactuated Nonlinear Systems," *Proc. Dyn. Sys. and Contr. Conf.*, DSCC2011-6057, Arlington, VA, October 2011.
- 10. P. Ghorbanian, S.G. Nersesov, and H. Ashrafiuon, "Obstacle Avoidance in Multi-Vehicle Coordinated Motion via Stabilization of Time-Varying Sets," *Proc. Amer. Contr. Conf.*, pp. 3381–3386, San Francisco, CA, June 2011.
- 11. A. Ajorlou, K. Moezzi, A. G. Aghdam, and S. G. Nersesov, "Two-Stage Energy-Optimal and Time-Optimal Formation Reconfiguration Strategies," *Proc. IEEE Conf. Dec. Contr.*, pp. 7455–7460, Atlanta, GA, December 2010.
- 12. W.M. Haddad, S.G. Nersesov, and V. Chellaboina, "Heat Flow, Work Energy, and Chemical Thermodynamics: A Dynamical Systems Perspective," *Proc. Amer. Contr. Conf.*, pp. 1196–1203, Baltimore, MD, June 2010.

- 13. S.G. Nersesov, H. Ashrafiuon, and P. Ghorbanian, "On the Stability of Sliding Mode Control for a Class of Underactuated Nonlinear Systems," *Proc. Amer. Contr. Conf.*, pp. 3446–3451, Baltimore, MD, June 2010.
- 14. S.G. Nersesov, P. Ghorbanian, and A. G. Aghdam, "Multi-Vehicle Coordinated Motion via Stabilization of Time-Varying Sets and Tracking," *Proc. Amer. Contr. Conf.*, pp. 4604–4609, Baltimore, MD, June 2010.
- 15. J.M. Avis, S.G. Nersesov, and R. Nathan, "Decentralized Energy-Based Hybrid Control for the Multi-RTAC System," *Proc. Amer. Contr. Conf.*, pp. 895-900, St. Louis, MO, June, 2009.
- 16. W.M. Haddad, S.G. Nersesov, and L. Du, "Finite-Time Stability Theory for Time-Varying Nonlinear Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 4135-4139, Seattle, WA, June, 2008.
- 17. J.M. Avis, S.G. Nersesov, and R. Nathan, "Energy-Based Hybrid Control for the RTAC System: Experimental Results," *Proc. Amer. Contr. Conf.*, pp. 3331-3336, Seattle, WA, June, 2008.
- 18. S.G. Nersesov, C. Nataraj, and J.M. Avis, "Design of Finite-Time Stabilizing Controllers for Nonlinear Dynamical Systems," *Proc. IEEE Conf. Dec. Contr.*, pp. 1740-1745, New Orleans, LA, December 2007.
- 19. S.G. Nersesov and W.M. Haddad, "Finite-Time Stabilization of Nonlinear Impulsive Dynamical Systems," *Proc. European Contr. Conf.*, pp. 91-98, Kos, Greece, July 2007.
- S.G. Nersesov, W.M. Haddad, and Q, Hui, "Finite-Time Stabilization of Nonlinear Dynamical Systems via Control Vector Lyapunov Functions," *Proc. Amer. Contr.* Conf., pp. 4810-4816, New York, NY, July 2007.
- 21. S.G. Nersesov and W.M. Haddad, "Control Vector Lyapunov Functions for Large-Scale Impulsive Dynamical Systems," *Proc. IEEE Conf. Dec. Contr.*, pp. 4813-4820, San Diego, CA, December 2006.
- 22. W.M. Haddad, Q. Hui, V. Chellaboina, and S.G. Nersesov, "Hybrid Decentralized Maximum Entropy Control for Large-Scale Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 1321-1326, Minneapolis, MN, June 2006.
- 23. S.G. Nersesov and W.M. Haddad, "Reversibility and Poincaré Recurrence in Linear Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 3704-3707, Minneapolis, MN, June 2006.
- 24. W.M. Haddad, V. Chellaboina, Q. Hui, and S.G. Nersesov, "Thermodynamic Stabilization via Energy Dissipating Hybrid Controllers," *Proc. IEEE Conf. Dec. Contr.*, pp. 4879-4884, Seville, Spain, December 2005.

- 25. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Time-Reversal Symmetry, Poincaré Recurrence, Irreversibility, and the Entropic Arrow of Time: From Mechanics to System Thermodynamics," *Proc. IEEE Conf. Dec. Contr.*, pp. 5995-6002, Seville, Spain, December 2005.
- 26. W.M. Haddad, Q. Hui, S.G. Nersesov, and V. Chellaboina, "Thermodynamic Modeling, Energy Equipartition, and Nonconservation of Entropy for Discrete-Time Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 4832-4837, Portland, OR, June 2005.
- 27. S.G. Nersesov and W.M. Haddad, "On the Stability and Control of Nonlinear Dynamical Systems via Vector Lyapunov Functions," *Proc. IEEE Conf. Dec. Contr.*, pp. 4107-4112, Paradise Island, Bahamas, December 2004.
- 28. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Vector Dissipativity Theory for Large-Scale Nonlinear Dynamical Systems," *Proc. IEEE Conf. Dec. Contr.*, pp. 3424-3429, Paradise Island, Bahamas, December 2004.
- 29. W.M. Haddad, Q. Hui, V. Chellaboina, and S.G. Nersesov, "Vector Dissipativity Theory for Discrete-Time Large-Scale Nonlinear Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 3699-3704, Boston, MA, July 2004.
- 30. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "A System Theoretic Foundation for Thermodynamics: Energy Flow, Energy Balance, Energy Equipartition, Entropy, and Ectropy," *Proc. Amer. Contr. Conf.*, pp. 396-417, Boston, MA, July 2004.
- 31. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Large-Scale Nonlinear Dynamical Systems: A Vector Dissipative Systems Approach," *Proc. IEEE Conf. Dec. Contr.*, pp. 5603-5608, Maui, HI, December 2003.
- 32. S.G. Nersesov, W.M. Haddad, and V. Chellaboina, "Optimal Fixed-Structure Control for Linear Nonnegative Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 3496-3501, Denver, CO, June 2003.
- 33. W.M. Haddad, T. Hayakawa, S.G. Nersesov, and V. Chellaboina, "Hybrid Adaptive Control for Nonlinear Impulsive Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 5110-5115, Denver, CO, June 2003.
- 34. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "A Unification Between Partial Stability of State-Dependent Impulsive Systems and Stability Theory of Time-Dependent Impulsive Systems," *Proc. Amer. Contr. Conf.*, pp. 4004-4009, Denver, CO, June 2003.
- 35. W.M. Haddad, S.G. Nersesov, and V. Chellaboina, "Energy-Based Control for Hybrid Port-Controlled Hamiltonian Systems," *Proc. IEEE Conf. Dec. Contr.*, pp. 1669-1674, Las Vegas, NV, December 2002.
- 36. W.M. Haddad, S.G. Nersesov, and V. Chellaboina, "A Lyapunov Function Proof of Poincaré's Theorem," *Proc. Amer. Contr. Conf.*, pp. 3922-3925, Anchorage, AK, May 2002.

- 37. S.G. Nersesov, V. Chellaboina, and W.M. Haddad, "A Generalization of Poincaré's Theorem to Hybrid and Impulsive Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 1240-1245, Anchorage, AK, May 2002.
- 38. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "Hybrid Nonnegative and Compartmental Dynamical Systems," *Proc. Amer. Contr. Conf.*, pp. 680-685, Anchorage, AK, May 2002.
- 39. V. Chellaboina, S.G. Nersesov, and W.M. Haddad, "A Generalization of Poincaré's Theorem to Periodic Hybrid Dynamical Systems," *Proc. ASME Int. Mech. Engin. Cong.*, New York, NY, Paper No. DSC-24593, November 2001.
- 40. R. Roup, D.S. Bernstein, S.G. Nersesov, W.M. Haddad, and V. Chellaboina, "Limit Cycle Analysis of the Verge and Foliot Clock Escapement using Impulsive Differential Equations and Poincaré Maps," *Proc. Amer. Contr. Conf.*, pp, 3245-3250, Arlington, VA, June 2001.
- 41. W.M. Haddad, V. Chellaboina, and S.G. Nersesov, "On the Equivalence Between Dissipativity and Optimality of Nonlinear Hybrid Controllers," *Proc. IEEE Conf. Dec. Contr.*, pp. 1403-1408, Sydney, Australia, December 2000.