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## EDUCATION

<b>M.I.T.</b> , Cambridge, MA	1999-2004
<b>Ph.D.</b> , Mechanical Engineering, September 2004	
<b>Boston University</b> , Boston, MA	1998-1999
<b>M.S.</b> , Manufacturing Engineering, September 1999. ( <b>Dean's Fellowship</b> )	
<b>Xi'an JiaoTong University</b> , Xi'an, China	1995-1998
Direct Ph.D. Program, System Engineering Institute	
<b>Xi'an JiaoTong University</b> , Xi'an, China	1991-1995
<b>B.S.</b> Electronics and Information Engineering	

## EXPERIENCE

<b>Assistant Professor</b>	2008-Present
Mechanical Engineering, University of Connecticut,	
<b>Research Scientist</b>	2005-2008
Aerospace and Ocean Engineering, Virginia Tech, Blacksburg, VA	
<b>Post-doc</b>	2004-2005
Aerospace and Ocean Engineering, Virginia Tech, Blacksburg, VA	

## PATENTS

- **A Methodology for Adaptive Output Feedback Control Design with Guaranteed Performance Specifications**, Chengyu Cao and Naira Hovakimyan, Patent Pending.
- **Neural Control Devices and Methods with Guaranteed Transient Performance and Stability Margins**, Chengyu Cao and Naira Hovakimyan, Patent Pending.
- **Low-pass Adaptive/neural Controller Device and Method with Improved Transient Performance**, Chengyu Cao and Naira Hovakimyan, Patent Pending. No. 11/387.067.

## PUBLICATIONS

### Journal Publications

- [1] C.Cao, Naira Hovakimyan,“L1 Adaptive Output-Feedback Controllers for Non-Strictly-Positive-Real Reference Systems: Missile Longitudinal Autopilot Design.” Journal of Guidance, Control, and Dynamics, vol. 32, No. 3, pp.717-726, May-June, 2009.
- [2] Vijay V. Patel, C. Cao, Naira Hovakimyan, Kevin A. Wise, Eugene Lavretsky ,“L1 adaptive controller for tailless unstable aircraft in the presence of unknown actuator failures”, International Journal of Control, Vol. 82, No. 4, 705–720, April 2009.
- [3] Naira Hovakimyan, Eugene Lavretsky, C.cao, “Dynamic inversion for multivariable non-affine-in-control systems via time-scale separation”, International Journal of Control, Vol. 81, No. 12, 1960–1967, December 2008.
- [4] C.Cao, Naira Hovakimyan,“Vision-based tracking using intelligent excitation", International Journal of Control, Vol. 81, No. 11, 1763–1778, November 2008
- [5] N.Hovakimyan, E.Lavretsky, C. Cao, "Adaptive Dynamic Inversion via Time-Scale Separation," IEEE Transactions on Neural Networks”, vol.19, no.10, pp.1702-1711, Oct. 2008.
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- [7] C. Cao, N.Hovakimyan, Johnny Evers, "Active control of visual sensor for navigation and guidance", Computational Management Science, Springer, June, 2008
- [8] Chengyu Cao; Hovakimyan, N., " L1 Adaptive Output Feedback Controller for Systems of Unknown Dimension," IEEE Transactions on Automatic Control , vol.53, no.3, pp.815-821, April 2008.
- [9] C. Cao, and N. Hovakimyan, “Design and Analysis of a Novel L1 Adaptive Controller with Guaranteed Transient Performance”, IEEE Transactions on Automatic Control, Vol 53, no.2, pp. 586 – 591, March, 2008.
- [10] J. Wang, V. Patel, C. Cao, N. Hovakimyan, and E. Lavretsky,“L1 Adaptive Neural Network Controller for Autonomous Aerial Refueling with Guaranteed Transient Performance”, AIAA Journal of Guidance, Control and Dynamics, pp. 182-193, No. 1, Vol. 31, January-February 2008.
- [11] A. Young, C. Cao, N. Hovakimyan, and E. Lavretsky,“An Adaptive Approach to Nonaffine Control Design for Aircraft Applications”, AIAA Journal of Guidance, Control, and Dynamics, pp. 1770-1782, No. 6, Vol. 30, November-December 2007.
- [12] C. Cao, N. Hovakimyan, and J. Wang, “Intelligent Excitation for Adaptive Control with Unknown Parameters in Reference Input”, IEEE Transactions on Automatic Control. pp. 1525-1532, No. 8, Vol. 52, August 2007.

- [13] C. Cao, and N. Hovakimyan, "Novel L1 Neural Network Adaptive Control Architecture with Guaranteed Transient Performance", IEEE Transactions on Neural Networks, pp. 1160-1171, No.4, Vol. 18, July 2007.
- [14] C. Cao, and A. Annaswamy, "A Hierarchical Discretized-parameter Polynomial Adaptive Estimator for Nonlinearly Parameterized Systems", International Journal of Control, pp.831-844, No. 8, Vol. 79, August 2006.
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Peer-reviewed conference proceedings

- [17] K. Wise, E. Lavretsky, N. Hovakimyan, C. Cao, J. Wang, "Verifiable Adaptive Flight Control: UCAV and Aerial Refueling", AIAA-2008-6658, AIAA Guidance, Navigation and Control Conference, Honolulu, HI, 2008.
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- [19] V. Dobrokhodov, I. Kitsiois, I. Kaminer, K. Jones, E. Xargay, N. Hovakimyan, C. Cao, M. Lizarraga, I. Gregory, "Flight Validation of Metrics Driven Adaptive Control," AIAA-2008-6987, AIAA Guidance, Navigation and Control Conference, Honolulu, HI, 2008.
- [20] D. Li, N. Hovakimyan, C. Cao, K. Wise, "Filter Design for Feedback-loop Trade-off of Adaptive Controller: A Linear Matrix Inequality Approach," AIAA-2008-6280, AIAA Guidance, Navigation and Control Conference, Honolulu, HI, 2008.
- [21] E. Kharisov, I. Gregory, C. Cao, N. Hovakimyan, "Adaptive Control Laws for Flexible Space Launch Vehicle and Proposed Plan for Flight Test Validation," AIAA-2008-7128, AIAA Guidance, Navigation and Control Conference, Honolulu, HI, 2008.
- [22] P. Aguiar, A. Pascoal, I. Kaminer, V. Dobrokhodov, E. Xargay, N. Hovakimyan, C. Cao, R. Ghabcheloo, "Time-Coordinated Path Following of Multiple UAVs over Time-Varying Networks using Adaptation," AIAA-2008-7131, AIAA Guidance, Navigation and Control Conference, Honolulu, HI, 2008.
- [23] C. Cao, and N. Hovakimyan, "L1 Adaptive Output Feedback Controller for Non Strictly Positive Real Reference Systems with Applications to Aerospace Examples", AIAA-2008-7288, AIAA Guidance, Navigation, and Control Conference and Exhibit, Honolulu, HI, 2008.

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- [26] L.Ma, C. Cao, and N. Hovakimyan , “Adaptive Vision-Based Guidance Law with Guaranteed Performance Bounds for Tracking a Ground Target with Time-Varying Velocity”, AIAA-2008-7445, AIAA Guidance, Navigation, and Control Conference and Exhibit, Honolulu, HI, 2008.
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- [32] Q. Wang and C. Cao, “Control Problems for Nonlinear Systems Given by Klein-Gordon-Maxwell Equations with Electromagnetic Field”, Proceedings of Conference on Decision and Control, 2007.?
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- [45] C. Cao, and N. Hovakimyan, "Novel L1 Neural Network Adaptive Control Architecture with Guaranteed Transient Performance", European Control Conference, 2007.
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- [63] C. Cao, N. Hovakimyan, and J. Evers, “Active Control of Visual Sensor for Aerial Tracking”, AIAA-2006-6610, AIAA Guidance, Navigation, and Control Conference and Exhibit, 2006.
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- [77] C. Cao and A. Annaswamy, "Parameter Convergence in System with a General Nonlinear Parameterization Using a Hierarchical Algorithm", Proceedings of American Control Conference, pp.382-387, 2002.
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#### **PROFESSIONAL SERVICES & REVIEWER**

- Associate Editor, Conference Editorial Board of the IEEE Control Systems Society, 2007-present
- Associate Editor, American Control Conference of AIAA submissions, 2006, 2007, 2008.
- Associate Editor, Conference on Decision and Control, 2008.
- Session Chair and Co-chair, American Control Conference, 2006, 2007, 2008.
- Session Chair and Co-chair, AIAA Guidance, Navigation and Control Conference and Exhibition, 2006, 2008.
- Session Co-chair, European Control Conference, 2007.
- Proposal Reviewer, Louisiana Board of Regents' Research Competitiveness Subprogram.
- Reviewer, IEEE Transactions on Neural Networks
- Reviewer, IEEE Transactions on Automatic Control
- Reviewer, Automatica
- Reviewer, IEEE Transactions on Control Systems Technology
- Reviewer, AIAA Journal of Guidance, Control, and Dynamics
- Reviewer, International Journal of Control, Automation, and Systems
- Reviewer, IEEE Transactions on Aerospace and Electronic Systems
- Reviewer, International Journal of Systems Science
- Reviewer, Acta Automatica Sinica



- Reviewer, American Control Conference 2004, 2005, 2006, 2007
- Reviewer, Conference on Decision and Control 2005, 2006, 2007
- Reviewer, IFAC 2008.
- Reviewer, ISIC-MED 2005
- Reviewer, European Control Conference 2007
- Reviewer, IEEE International Conference on Robotics and Automation 2007
- Reviewer, IEEE Multi-conference on Systems and Control 2007
- Reviewer, CCA, CACSD, and ISIC, 2006.
- Judge of AIAA student paper competition, 2006.