

# Curriculum Vitae

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### Research Area

- Networked Control Systems, Attitude Estimation/Control using Inertial and Vision Sensors

### Education

- April 1994 - March 1997 : Ph. D., University of Tokyo, Dept. of Mathematical Eng. and Information Physics  
Advisor : Prof. Seiichi Shin  
Ph.D. Thesis : Control System Design of State Delay Systems
- March 1990 - February 1992 : M.S., Seoul National University, Dept. of Control & Instrumentation Engineering  
Advisor : Prof. Wook Hyun Kwon  
Master Thesis : Study on filters and smoothers in the generalized interval
- March 1986 - February 1990 : B.S., Seoul National University, Dept. of Control & Instrumentation Engineering

### Experience

- March 2004 - Present : Associate Professor, School of Electrical Engineering, University of Ulsan, Korea
- March 2000 - February 2004 : Assistant Professor, School of Electrical Engineering, University of Ulsan, Korea
- April 1997 - December 1998 : Visiting Researcher, National Institute of Advanced Industrial Science and Technology, Japan

### Awards

- Fifth place award (out of 18 teams) : Team Tornado, 1st Korea Robot Aircraft Competition, UAV Autonomous Flight Competition Area, Oct., 2002.

### Publication List

#### Journal Articles

1. Y. S. Suh, V. H. Nguyen, Y. S. Ro, "Modified Kalman filter for networked monitoring systems employing a send-on-delta method," *Automatica*, Vol. 43, No. 2, pp. 332-338, 2007.
2. Y. S. Suh, H. J. Kang, Y. S. Ro, " $H_2$  Filter for Time Delay Systems," *International Journal of Control*,

- Automation, Systems, Vol. 4, No. 5, pp. 539-544, 2006.
3. Y. S. Suh, "Attitude Estimation by Multiple-Mode Kalman Filters," IEEE Tr. on Industrial Electronics, Vol. 53, No. 4, pp. 1386-1389, 2006.
  4. Y. S. Suh, H. J. Kang, and Y. S. Ro, "Stability condition of distributed delay systems based on an analytic solution to Lyapunov functional equations," Asian Journal of Control, Vol. 8, No. 1, pp. 91-96, 2006.
  5. Y. S. Suh, S. K. Park, H. J. Kang, Y. S. Ro, "Attitude Estimation Adaptively Compensating External Acceleration," JSME International Journal Series C, Vol. 49, No. 1, pp. 172-179, 2006.
  6. Y. S. Rho, H. J. Kang, Y. S. Suh, "Wireless LAN based Teleoperation of Mobile Robots," ICASE Journal, Vol. 12, No. 3, pp. 264-268, 2006.
  7. Y. S. Suh, Y. M. Choi, Y. S. Rho, and H. J. Kang, "Attitude Control of Two Rotor 1 DOF Aerial Vehicle," Proc. of KIEE Journal, Vol 54D, No. 2, pp. 61-68, 2005.
  8. Y. S. Suh, H. H. Lee, Y. S. Rho, and H. J. Kang, " $H_2$  controller Design for Networked Control Systems with Time-Varying Delay," ICASE Journal, Vol. 10, No. 12, pp. 1196-1201, 2004.
  9. E. H. Jung, Y. S. Suh, and H. H. Lee, "State Feedback Stabilization of Network Based Control Systems with Time-Varying Delay," Proc. of KIEE Journal, Vol. 53D, No. 11, pp. 741-746, 2004.
  10. Y. S. Suh, Y. S. Ro, H. J. Kang, and H. H. Lee, "Necessary and Sufficient Stability Condition of Discrete State Delay Systems," International Journal of Control, Automation, and Systems, Vol. 2, No. 4, pp. 501-508, 2004.
  11. H. J. Hong, Y. S. Rho, H. J. Kang, Y. S. Suh, and T. H. Kim, "Development of the Simulation Tool for the Modeling and Traffic Control of a AGV System," Journal of Fuzzy Logic and Intelligent Systems, Vol. 14, No. 4, pp. 499-505, 2004.
  12. Y. S. Suh, "Robust control of a quad-rotor aerial vehicle," International Journal of Applied Electromagnetics and Mechanics, Vol. 18, pp. 103-113, 2003.
  13. Y. S. Suh, "Stability of Time Delay Systems Using Numerical Computation of Argument Principles," International Journal of Control, Automation, and Systems, Vol. 1, No. 1, pp. 127 - 133, 2003.
  14. Y. J. Oh and Y. S. Suh, " $H_\infty$  Control of Level Maintaining Device," Proc. of KIEE Journal, Vol. 52D, No. 2, pp. 77-84, 2003.
  15. J. W. Choi, S. W. Lee, and Y. S. Suh, "Observer-Based Robust Fault Diagnosis and Reconfigurable Adaptive Control for Systems with Unknown Inputs," ICASE Journal, Vol. 8, No. 11, pp. 928-934, 2002.
  16. Y. S. Suh, "Periodic Properties of a Lyapunov Functional of State Delay Systems," KIEE International Transactions on SC, Vol. 2-D, No. 2, pp. 92-96, 2002.
  17. Y. S. Suh, "Stability of Time-Varying Discrete State Delay Systems," Proc. of KIEE Journal, Vol. 51D, No. 2, pp. 43-47, 2001.
  18. J. W. Choi, D. Y. Lee, Y. S. Suh, U. S. Park, S. B. Lee, "A Fault Isolation Filter Design Using Left Eigenstructure Assignment Scheme," KSME International Journal, Vol. 14, No. 6, pp. 583-589, 2000.
  19. Y. S. Suh, "Diagonal balanced truncation of discrete delay systems," Automatica, Vol. 35, No. 11, pp. 1855-1860, 1999.
  20. Y. S. Suh and S. Shin, "Stability of State Delay Systems Based on Finite Characterization of a Lyapunov Functional," Trans. of the Society of Instrument and Control Engineers, Vol. 35, No. 9, pp. 1170-1175, 1999.
  21. Y. S. Suh and S. Shin, "Modified Balanced Truncation of State Delay Systems," Trans. of the Society of Instrument and Control Engineers, Vol. 35, No. 7, pp. 896-903, 1999.
  22. Y. S. Suh and S. Shin, "Stability Condition of State Delayed Systems Based on Stability Guaranteed Discretization," Trans. of the Society of Instrument and Control Engineers, Vol. 33, No. 5, pp. 403-408, 1997.
  23. W. H. Kwon, Y. S. Suh, Y. I. Lee, O. K. Kwon, "Equivalence of Finite Memory Filters," IEEE Transactions on

### International Conference Articles

1. Y. S. Suh, S. K. Park, D. Kim, and K. Jo, "Remote control of a moving robot using the virtual link," IEEE International Conference on Robotics and Automation, Roma, 2007.
2. Y. S. Suh, V. H. Nguyen, and Y. S. Rho, "Networked Estimation Using a Send-on-delta Method," 32nd Annual Conference of the IEEE Industrial Electronics Society, Paris, pp. 4622-4626, 2006.
3. L. M. K. Do, Y. S. Suh, and V. H. Nguyen, "Networked Kalman Filter with Sensor Transmission Interval Optimization," SICE-ICASE International Joint Conference 2006, Busan, pp. 1047-1052, 2006.
4. Y. M. Choi, Y. S. Suh, and S. K. Park, "Pose Estimation from Landmark-based vision and inertial sensors," SICE-ICASE International Joint Conference 2006, Busan, pp. 1668-1671, 2006.
5. N. H. Q. Phuong, H. J. Kang, Y. S. Suh, Y. S. Ro, and K. C. Lee, "A GPS/INS Integration System for Land Vehicle Application," SICE-ICASE International Joint Conference 2006, Busan, pp. 482-487, 2006.
6. Y. S. Suh, V. H. Nguyen, Y. S. Ro, and H. J. Kang, "State Estimation via a Serial Network with Different Transmission Periods," in Proceedings of 1st IEEE conference on Industrial Electronics and Applications, Singapore, pp. 215-220, 2006.
7. Y. S. Suh, C. W. Lee, H. H. Lee, and Y. S. Ro, " $H_2$  networked servo control systems with time-varying delays," 2005 American Control Conference, Portland, pp. 644-649, 2005.
8. Y. S. Suh, H. H. Lee, Y. S. Rho, and M. J. Yi, "Networked Control Systems using  $H_2$  Multirate Control," in Proceedings in 2004 IEEE International Workshop on Factory Communication Systems, Vienna, Austria, pp. 403-406, 2004.
9. E. H. Jung, H. H. Lee, and Y. S. Suh, "LMI-based Output Feedback Control of Networked Control Systems," in Proceedings in 2004 IEEE International Workshop on Factory Communication Systems, Vienna, Austria, pp. 311-314, 2004.
10. H. J. Hong, Y. S. Rho, H. J. Kang, and Y. S. Suh, "A Simulator for AGV System Modeling," in Proceedings of the 8th Korea-Russia International Symposium, Ulsan, Tomsk, pp. 223-226, 2004.
11. Y. S. Suh and S. K. Park, "Attitude estimation by multiple mode Kalman filters," in Proceedings of the International Conference on Mechatronics and Information Technology, Jecheon, Korea, pp. 664-669, 2003.
12. Y. S. Suh, "Attitude Estimation using Low Cost Accelerometer and Gyroscope," in Proceedings of the 7th Korea-Russia International Symposium, Ulsan, Korea, pp. 423-427, 2003.
13. Y. S. Suh, "Kalman Filter for Output Delay Systems," in Proceedings of the 41st IEEE Control and Decision Conference, Las Vegas, U.S.A., pp. 3033-3034, 2002.
14. Y. S. Suh, "Stability of Discrete State Delay Systems," in Proceedings of the 40th IEEE Control and Decision Conference, Orlando, U.S.A., pp. 4727-4732, 2001.
15. Y. S. Suh, "Stability of Time Delay Systems using Numerical Computation of Argument Principles," in Proceedings of the 40th IEEE Control and Decision Conference, Orlando, U.S.A., pp. 4738-4743, 2001.
16. Y. S. Suh, "Robust Control of a Quad-Rotor Aerial Vehicle," in Proceedings of the International Conference on Mechatronics and Information Technology, Yamaguchi, Japan, pp. 298-301, 2001.
17. H. C. Lee, J. W. Choi, and Y. S. Suh, "Eigenvalue Assignment for LTV Systems Using Ackermann-like Formula," in Proceedings of the International Conference on Mechatronics and Information Technology, Yamaguchi, Japan, pp. 204-209, 2001.
18. Y. S. Suh and T. W. Chun, "Speed control of a PMSM motor based on the new disturbance observer," in Proceedings of the 2001 IEEE Industry Applications Conference 36th Annual Meeting, Chicago, pp. 1319-1323,

Vol 2., 2001.

19. Y. S. Suh, "Stability condition of distributed delay systems based on the analytic solution of Lyapunov functional equations," in Proceedings of the 39th IEEE Control and Decision Conference, Sydney, Australia, pp. 2829-2830, 2000.
20. Y. S. Suh and J. W. Choi, "Continuous-time Deadbeat Fault Detection and Isolation Filter Design," in Proceedings of the 38th IEEE Control and Decision Conference, Phoenix, Arizona, pp. 3130-3131, 1999.
21. Y. S. Suh, W. G. Lee and M. H. Lee, "Stability of discrete state delay systems," in Proceedings of the 14th Korea Automatic Control Conference, Yongin, Korea, Vol. E, pp. 112-115, 1999.
22. Y. S. Suh and M. H. Lee, "Stability of State Delay Systems Based on a Lyapunov Functional," in Proceedings of IEEE International Symposium on Industrial Electronics, Bled, Slovenia, Vol. 3, pp. 1093-1098, 1999.
23. Y. S. Suh, "Stability of State Delay Systems," in Proceedings of Korea-Japan Joint Workshop on Robust and Predictive Control of Time Delay Systems, pp. 118-127, 1999.
24. Y. S. Suh, Y. Endou, D. Gothoh, A. Kiyota, H. Okabe, H. Niwaya, and S. Inui, "Virtual Sewing System for Apparel Design," in Short Presentation Proc. of Eurographics 98, Portugal, 1998.
25. Y. S. Suh and S. Shin, "Stability Condition of State Delay Systems Combining a Frequency Domain Approach and a Lyapunov Functional Approach," in Proceedings of the 2nd Asian Control Conference, Seoul, Korea, Vol. 3, pp. 539-542, 1997.
26. Y. S. Suh and S. Shin, "Stability Condition of State-delayed Systems Based on Stability Guaranteed Discretization," in Proceedings of the 35th IEEE Control and Decision Conference, Kobe, Japan, 1996.
27. Y. S. Suh and S. Shin. "On H infinity Control of State Delayed Systems Using Sampled-data Control," in Proceedings of the 35th SICE Annual Conference, Tottori, Japan, pp. 71-72, 1996.

## Patents

1. Robot calibration system using perceptron sensor (KR-0637378), October 16, 2006.
2. Method for detecting magnetic field of outside interference using vehicle compass system (KR-0620895), August 30, 2006.
3. Method for transmitting multiple sensors data with a CAN message (KR-0609493), July 28, 2006.
4. Control apparatus for hybrid welding (KR-0602200), July 10, 2006.
5. Operating method of digital non disaster record board and that of apparatus (KR-0584159), May 22, 2006.
6. Assistance apparatus for automatic control in radio control system (KR-0560057), March 6, 2006.

## Projects

- Underwater Communication Based Navigation and Remote Control System Middleware for Autonomous Underwater Vehicles, March 2006 - February 2009, sponsored by Korea Science and Engineering Foundation.
- Networked Control System, March 2005 - February 2008, sponsored by MOCIE(Ministry of Commerce, Industry and Energy) through NARC(Network-based Automation Research Center), University of Ulsan.
- Time-delay compensating controllers for networked control systems, July 2002 - February 2005, sponsored by NARC(Network-based Automation Research Center), University of Ulsan.
- High precision and speed laser vision measurement system for automobile parts, December 2003 - August 2006, sponsored by MOCIE(Ministry of Commerce, Industry and Energy).