JeongHeon Han

Address

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Education

Ph.D. Candidate : Mechanical & Aerospace Engineering
March 2003 University California at San Diego
- Proposed title : Convexifying Approach for Nonconvex Control Systems

Ph.D. Student : Mechanical Engineering
February 1998 POSTECH (Pohang University of Science & Technology), Pohang, Korea
- Research Topic : Robust Control of Multiple Redundant Robotic Systems

M.S. : Mechanical Engineering
February 1996 POSTECH (Pohang University of Science & Technology), Pohang, Korea
- Thesis : Task Based Design of Modular Robot Manipulator using Efficient Genetic Algorithm

B.S. : Mechanical Engineering
February 1994 YONSEI University, Seoul, Korea
- Thesis : Optimal State Feedback Control of Thin Plate Using Piezo Electric Actuator

Professional Skills

- **Computer Languages/Software Packages**
  C/C++, Pascal, FORTRAN, MATLAB,MATHEMATICA, MAPLE, etc.
- **Platforms**
  Windows, Unix, Linux, Cygwin, Macintosh
- **Computer-based Hardware Design**
  Robot Design and Implementation of the POSTECH Modular Robot Manipulator

Honors

UCSD MAE dept. Dissertation Fellowship : 2004 Winter

Academic Experience

Graduate Research Assistant
1999 - current GRA. Structural Systems and Control Lab, MAE, University California San Diego, CA
1994 - 1998 GRA,Robotics Lab., ME, Pohang University of Science & Technology, Pohang, Korea

Graduate Teaching Assistant
2003. Spring GTA, MAE, University California San Diego, CA
1994. Spring GTA, ME, POSTECH (Pohang University of Science & Technology), Pohang, Korea

Research & Professional Project

- Development of POSTECH Modular Robot Manipulator
- Adaptive Steering Control of AGV (Automated Guidance Vehicle)
- Control Input Reconstruction Algorithm using Redundancy for Kinematically Redundant Manipulators under Control Input Limitations
- Nonlinear Robust and Optimal Control for a Redundant Robot Manipulator
- Development of TenSoft (Dynamic Simulator of Tensegrity Structures)
- Research on the Statics and Dynamics of a Tensegrity Structure
- Economic structure and control system design in the presence of devices with finite signal-to-noise ratio
- Convexifying LMI(Linear Matrix Inequality) Methods for State and Dynamic Output Feedback Control of a Stochastic Linear System
- Matrix Rank Minimization Heuristic with Applications

Publications

Journal Papers and Book chapters

- **"Equilibrium Conditions for a Class I Tensegrity Structures"**, Darrell Williamson, Robert E. Skelton, and JeongHeon Han, *Revue française de génie civil*, July, 2003, pp. 291-310.
- **"Equilibrium Conditions of a Tensegrity Structures"**, JeongHeon Han, Darrell Williamson, Robert E. Skelton, *International Journal of Solids and Structures*, 40, Nov. 2003, pp. 6347-6367.
- **"System Modelings and Model Reduction"**, Robert E. Skelton, JeongHeon Han, and Mauricio de Oliveira, invited chapter of the *Handbook of Smart Systems and Materials*, Institute of Physics (IOP), [to appear in 2004].

Journal Papers (In Preparation)

- **"An LMI optimization approach to the Design of Structured Linear Controllers using the Convexifying Algorithm"**, JeongHeon Han, and Robert E. Skelton
- **"Simultaneous Plant and Controller Design using Linearization"**, JeongHeon Han, and Robert E. Skelton
- **"A New Synthesis Condition of Dynamic Output Feedback Controller for Linear Discrete-Time Systems"**, JeongHeon Han, and Robert E. Skelton
- **"Optimal Output Feedback Control under Multiplicative and Additive Noises"**, JeongHeon Han, and Robert E. Skelton

Proceedings

- "Task Based Design of Modular Robot Manipulator using Efficient Genetic Algorithms", Jeongheon Han, W.K.Chung, Y.Youm, Proc. of the 11th Korea Automatic Control Conference, International Program, pp.243-246, 1996
- "Determination of Optimal manipulator Configuration from Task Specifications", J.Han, Y.Youm and W.K.Chung, Proc. of Korea Automatic Conference(KACC), Seoul, Oct., pp.932-935, 1995
- "Task Based Design of Modular Robot Manipulator using Efficient Genetic Algorithms",J.Han,W.K.Chung, Y.Youm and S.H.Kim , IEEE Proc. of IEEE Int. Conf. on Robotics and Automation Albuquerque, April, pp 507-512, 1997
- "Equilibrium Conditions of a Class I Tensegrity Structure (AAS 02-177)", Robert E. Skelton, Darrell Williamson and JeongHeon Han , pp 927 – 950, Volume 112 Part II, Advances in the Astronautical Sciences, Spaceflight Mechanics 2002
- **"Equilibrium Conditions of a Tensegrity Structures"**, Darrell Williamson, Robert E. Skelton, and JeongHeon Han, Third World Conference on Structural Control (3WCSC), Como, Italy, April 7-12, 2002
- **"An LMI optimization approach for Structured Linear Controllers"**, JeongHeon Han, and Robert E. Skelton, pp.5143-5148, 2003 IEEE, CDC
- **"An LMI optimization approach to the Design of Structured Linear Controllers using a Linearization Algorithm"**, JeongHeon Han, and Robert E. Skelton, 2003 ASME IMECE

Relevant Graduate Courseworks

- Linear Dynamic Systems I,II
- Linear Control Systems
- System Identifications
- Optimal Control I, II
- Robust Control I, II
- Adaptive Control I, II
- Nonlinear Dynamic Systems I, II
- Nonlinear Control Systems
- Digital Control
- Advanced Control System
- Intelligent Control Systems(Fuzzy, Genetic, Neural Networks)
- Multivariable Dynamic Systems
- Numerical Optimization I, II, III
- Numerical Mathematics I,II,III
- Numerical Methods I,II
- Advanced Dynamics
- Advanced Kinematics
- Advanced Robotics
- Advanced Electrical Experiments
- Advanced Fluid Dynamics
- Advanced Solid Mechanics
- Finite Element Analysis I,II