Nolan Tsuchiya, P.E., Ph.D.

Education

June 2015   **Doctor of Philosophy, Mechanical Engineering**, *University of California, Los Angeles*.
Major Field: Dynamic Systems and Control

Dec 2012   **Master of Science, Mechanical Engineering**, *University of California, Los Angeles*.

May 2006   **Bachelor of Science, Mechanical Engineering**, *University of California, Berkeley*.

License

May 2009   Professional Engineer (P.E.) license in Mechanical Engineering, California

Awards

May 2016   Pi Tau Sigma, mechanical engineering honors society, *Purple Shaft* Outstanding Professor Award (2015-2016)

Teaching Experience

Fall 2015 - Present   **Assistant Professor**, *Cal Poly Pomona*, Mechanical Engineering.
- Teaching a range of courses from introductory seminar to senior-level. ME100L, ME232A, ME340, ME439/L.
- Managing all additional non-teaching related aspects of full-time faculty status including:
  - Advising several senior project students
  - Advising CPP ASHRAE Club
  - Advising CPP SpaceX Hyperloop design competition
  - Participating in department activities and serving on Graduate Studies and Assessment committees
  - ME program coordinator for COE Project Symposium
  - Conducting research in the field of Dynamic Systems and Control
  - Assisting in managing ME Online, online directory of video tutorials / instructional videos

Winter 2014, Fall 2014   **Lecturer**, *Cal Poly Pomona*, ME439/L: Control of Mechanical Systems.
- Lectured senior-level laboratory course in dynamic systems and feedback control principles
- Managed all aspects of teaching an advanced college-level course. Responsibilities included:
  - Developing course curriculum and lecture notes
  - Writing and grading all homework, laboratory assignments, and exams
  - Organizing and supervising lab demonstration days during which students presented their projects and discussed relevant control theory learned in lecture
  - Holding office hours to help students one-on-one

2012 - 2013   **Teaching Associate**, *UCLA*, MAE171A: Feedback and Control Systems.
- Taught principles of feedback control, control systems design, and system stability during weekly 2-hour discussion sections
- Conducted weekly office hours to answer students' questions, developed small-group teaching skills
- Wrote assignments and exams by collaborating with the professor

Research Experience

2011-2015 **Graduate Student Researcher**, *UCLA Beam Control Laboratory*.
- **Adaptive Control of Laser Beam Jitter**
  - Develop and apply novel adaptive Jitter control algorithms to experimental applications
  - Implement a receding-horizon (model-predictive) adaptive lattice filter control scheme to a laboratory laser beam disturbance rejection experiment
  - Built experimental laser beam steering experiment which features a laser source, two dual-axis fast steering mirrors, an optical position sensor, and all required optics. Helped lab members set up similar experiments. Gained proficiency setting up complex laboratory experiments
  - Utilize xPC Target real-time testing environment within the MATLAB / Simulink program
- **System Identification**
  - Apply adaptive filtering algorithm to identify plant models in real time in the presence of complex, broadband disturbances
  - Novel system identification technique allows adaptive control schemes to run in real time without requiring a plant model a priori

2012-2013 **Graduate Student Researcher**, *UCLA Mechatronics and Control Laboratory*.
- **Adaptive Disturbance Rejection on Magnetic Bearing**
  - Collaborated with graduate students in the UCLA Mechatronics and Control Laboratory on a magnetically-levitated bearing experiment (Magnetic Bearing)
  - Set up a magnetic bearing experiment with a mechanism to add a broadband disturbance
  - Implemented multi-channel adaptive control algorithm to reject bearing disturbances in real time

Industry Experience

2009-2010 **Applications Engineer**, *Syserco Energy Management, Inc*, Fremont, California.
- Designed direct digital control (DDC) systems for mechanical HVAC systems in Northern California high-tech, biotech, and corporate office buildings
- Composed system sequence of operations for systems with emphasis on energy efficiency
- Collaborated with project managers to produce accurate engineering submittals

2007-2009 **Mechanical Engineer**, *ACCO Engineered Systems*, San Leandro, California.
- Worked with project managers to design HVAC systems in a fast-paced design build environment.
- Developed coordination skills required to produce deliverables on schedule
- Contributed to all job phases from initial drawings, to field coordination, to final design
- Daily work included: building load calculations, equipment selection, duct/pipe sizing and layout, CAD drafting, LEED documentation, field coordination with other trades, maintaining communication between project managers, architects, and subcontractors

Publications / Works in Progress

K. Anderson, N. Tsuchiya, and T. Gross, "Using opto-22 programmable automatic controllers (pacs) to teach industrial mechatronics," in *CAINE, (Accepted)*, 2016.

N. Tsuchiya, C. Kang, J. S. Gibson, and T.-C. Tsao, "Adaptive control of a coupled-channel magnetically levitated bearing experiment," in *IEEE Transactions Control Systems Technology*, *(Editting)*, 2016.

C. Kang, N. Tsuchiya, J. S. Gibson, and T.-C. Tsao, "Harmonic and stochastic disturbance rejection on an active magnetic bearing-rotor system," *(In Progress)*, 2016.

N. Tsuchiya, J. S. Gibson, T.-C. Tsao, and M. Verhaegen, "Receding-horizon adaptive control of laser beam jitter," in *IEEE Transactions on Mechatronics*, April 2015.

C. Kang, N. Tsuchiya, J. S. Gibson, and T.-C. Tsao, "Modeling and control of magnetic bearings," *UCLA Tech Forum, Poster Session*, February 2014.

N. Tsuchiya, C. Kang, J. S. Gibson, and T.-C. Tsao, "Receding-horizon adaptive control of a magnetic levitation bearing," in *IFAC American Control Conference*, Chicago, IL, *(Not Accepted)*, December 2014.

N. Tsuchiya, J. S. Gibson, T.-C. Tsao, and M. Verhaegen, "Control of jitter in a laser beam experiment by receding-horizon adaptive control," in *IFAC Symposium on Mechatronic Systems*, Hangzhou, China, April 2013.