

Nolan Tsuchiya, PE, PhD

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 - Present Active Professional Engineer (PE) 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.
 - Performing all non-teaching tenure-track faculty duties including:
 - Advising senior projects and serving on graduate thesis committees
 - Advising Student Clubs: ASHRAE, SpaceX Pod Design Competition, SAE Super Mileage, SAE Baja Racing, Club Roller Hockey
 - Actively participating in department, college, and university level committees
 - Conducting research in the field of systems and control, as well as engineering education
- Winter 2014, **Lecturer**, *Cal Poly Pomona*, ME439/L: CONTROL OF MECHANICAL SYSTEMS.
- Fall 2014
- 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

- 2012 **Consulting Engineer (Top Gear America), The Discovery Channel.**
- Worked with a producer to generate engineering calculations and feasibility tests for one episode of the television show *Top Gear America*
 - Gained experience in writing technical documents for a non-technical audience
- 2011 **Consulting Engineer (Season 1 of Stuck With Hackett), The Science Channel.**
- Engineered several schemes and mechanisms for *MacGuyver-meets-Survivorman* reality television show *Stuck With Hackett*, in which the show's only character, Hackett, sets out to engineer and build modern luxuries from scrap parts and junk
 - Learned to collaborate and convey technical ideas and concepts to people from non-technical backgrounds
- 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 designs
 - 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
- 2006-2007 **Systems Engineer, Siemens Building Technologies, Hayward, California.**
- Worked with sales team and project managers to design building automation systems for major Northern California buildings
 - Designed direct digital control (DDC) systems and architecture for new buildings and complex retrofits

Publications / Works in Progress

- P. Nissenson and N. Tsuchiya, "Creating an online engineering video library at a state university," (Pomona, CA), AAAS, Pacific Division Meeting, June 2018.
- D. Gordon, K. Anderson, and N. Tsuchiya, "Application of the levenberg-marquardt algorithm to control a gough-stewart platform," (Pittsburgh, PA), IMECE, ASME, November 2018.
- D. Gordon, K. Anderson, and N. Tsuchiya, "Implementation of a gough-stewart platform controller using the levenberg-marquardt algorithm," (Snowbird, UT), SIAM, Applications of Dynamical Systems (**Abstract Accepted**), May 2019.
- 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*, (**In Progress**), 2018.
- 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**), 2018.
- Z. Jiang, A. Maxwell, Z. Merchant, N. Tsuchiya, and C. Chen, "Evaluation of the effectiveness of using mobile learning in engineering dynamics and vibrations courses," (Salt Lake City, UT), ASEE, June 2018.
- N. Tsuchiya, Z. Jiang, A. Maxwell, and Z. Merchant, "Implementation and assessment of a remotely accessible laboratory in an engineering dynamic systems course," (Salt Lake City, UT), ASEE, June 2018.
- E. Hough, A. Gurr, B. Hans, Z. Annala, R. Gar, and N. Tsuchiya, "Tabletop selective laser sintering 3d printer," (Tampa, FL), ASME, IMECE, November 2017.
- N. Tsuchiya, P. Nissenson, and M. Jawaharlal, "A student assessment of the value of a redesigned first year mechanical engineering orientation course," (Tempe, AZ), ASEE PSW, April 2017.
- K. Anderson, N. Tsuchiya, and T. Gross, "Programmable automation controller mechatronic experiment," vol. 1, Intl. Journal of Robotics and Automation, January 2017.
- N. Tsuchiya, J. S. Gibson, T.-C. Tsao, and M. Verhaegen, "Receding-horizon adaptive control of laser beam jitter," *IEEE/ASME Transactions on Mechatronics*, vol. 21, no. 1, pp. 227–237, 2016.
- 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, 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.