Joshua Philip Switkes

965 Roble Ave, Menlo Park, CA 94025
Tel: (650) 387-6428
josh@switkes.com
http://www.switkes.com

EDUCATION

Stanford University, Stanford CA. Ph.D in Mechanical Engineering under Professor J. Christian Gerdes, January 2007. Master of Science in Mechanical Engineering, January 2003.

- Developed, Implemented and Tested Active Lanekeeping Assistance System with Handwheel Force Feedback. Thesis: *Handwheel Force Feedback with Lanekeeping Assistance: Combined Dynamics, Stability and Bounding*
- Coursework focus on Control Theory and Vehicle Dynamics

Harvey Mudd College, Claremont CA. Bachelor of Science in Engineering, May 2001 with School Distinction and Departmental Honors.

AREAS OF EXPERTISE AND SKILL

Theory	*Application*
Vehicle Dynamics and Control	Mechatronics
Driver Assistance Systems	Real-Time Operating Systems
Linear, Nonlinear and Hybrid Control	Machining and Fabrication
State Estimation	Electronics: Analog, Digital
System Identification	Matlab, Simulink, XPC
Convex Optimization	

EXPERIENCE

Volkswagen Electronics Research Lab *Senior Engineer*, Palo Alto, CA. Developing driver assistance and active safety systems. Fall 2007-Present

- Developing control algorithms for Driver Assistance Systems for production Audi and Volkswagen vehicles.
- Researching advanced sensing and state estimation techniques for vehicle control and safety systems
- Scouting novel technologies from the US for inclusion in VW group vehicles

Dynamic Design Lab, Stanford University. Developed active lanekeeping assistance for automotive applications. Fall 2001-Fall 2007

- Implemented and demonstrated realtime path tracking using GPS/INS and Steer-by-wire

- Developed and validated model of vehicle and handwheel system for steer-by-wire force feedback.
- Confirmed mathematical bound on vehicle motion experimentally using this model.
- Designed and Implemented handwheel force feedback hardware for steer-by-wire in Corvette test vehicle and in immersive driving simulator.
- Interfaced 2006 Mustang GT body with driving simulator for force feedback, instrument panel, brake feel, audio, turn signal operation.

Toyota Technical Center, Torrance CA. Analyzed and tested various vehicle components for their effect on overall noise and vibration in Noise Vibration and Harshness department. Summer 2001

DePietro Fellowship Program, Claremont CA. Tested and analyzed dynamics of large structures with Dr. Z. H. Duron, including analytical modal analysis and on-site forced vibration testing of structures using eccentric mass shaker. Summer 2000

Harvey Mudd College Clinic Program, Claremont CA. Designed compact turbine generator system for golf course sprinklers as member of five-person design team. Included physical detail design using Solid Works CAD and rapid prototyping, as well as thorough laboratory testing of power generation characteristics. Awarded Alford-Gilkeson award for outstanding work in team design project. Spring 2000

General Motors Powertrain, Ypsilanti MI. Developed improved FEA and experimental methods of friction material pressure profile determination for torque converter clutches. Summer 1999

PUBLICATIONS

G.F. Schmidt, K.L.R Talvala, J.P. Switkes, M. Kiss, J.C. Gerdes. *Changing Lanes with Active Lanekeeping Assistance: A Simulator Study*. Human Factors and Ergonomics Society Europe Chapter Annual meeting, Braunschweig, Germany, October 2007.

J.P. Switkes, J.C. Gerdes, G.F. Schmidt, M. Kiss. *Driver Response to Steering Torque Disturbances: A User Study on Assisted Lanekeeping*. IFAC Advances in Automotive Control Conference, Monterey, CA, August 2006.

G.F. Schmidt, J.P. Switkes, J.C. Gerdes, M. Kiss. VDI/VW Gemeinschaftstagung *"Integrierte Sicherheit und Fahrerassistenzsysteme",* Wolfsburg, Germany, Oct 2006.

J.P. Switkes, J.C. Gerdes, *An Energy Based Performance Bound for Lanekeeping Assistance with Force Feedback*, International Symposium on Advanced Vehicle Control, Taipei Taiwan, August 2006.

J.P. Switkes, E.J. Rosseter, J.C. Gerdes. *Handwheel Force feedback for Lanekeeping Assistance: Combined Dynamics and Stability*, to appear in Journal of Dynamic Systems Measurement and Control.

J.P. Switkes, J.C. Gerdes. *Guaranteeing Lanekeeping Performance With Tire Saturation Using Computed Polynomial Lyapunov Functions*, International Mechanical Engineering Congress and Exposition, Orlando FL, Nov 2005.

J.P. Switkes, I.A. Coe, J.C. Gerdes. *Using MEMS Accelerometers to Improve automobile Handwheel State Estimation for Force Feedback*, International Mechanical Engineering Congress and Exposition, Anaheim CA, Nov 2004.

J.P. Switkes, E. J. Rossetter, I.A. Coe, J. Christian Gerdes. *Handwheel Force Feedback for Lanekeeping Assistance: Combined Dynamics and Stability*, International Symposium on Advanced Vehicle Control, Arnhem Netherlands, August 2004.

E.J. Rosseter, J.P. Switkes, J.C. Gerdes. *Experimental Validation of the Potential Field Driver Assistance System*, International Journal of Automotive Technology, June 2004; v5, no. 2, p. 95-108.

E.J. Rosseter, J.P. Switkes, J.C. Gerdes. *A Gentle Nudge Towards Safety: Experimental Validation of the Potential Field Driver Assistance System*, American Control Conference 2003, Denver CO, June 4-6, 2003.

P.D. Cha, J.P. Switkes. *Enforcing structural connectivity to update damped systems using frequency response*, AIAA Journal, June 2002.

AWARDS/DISTINCTIONS

National Science Foundation Graduate Fellowship (2002-05)
Mechanical Engineering Departmental Fellowship, Stanford. (2001)
Harry Williams Award in Mechanics (2001)
Graduation with Distinction and Dept. Honors, Harvey Mudd College (2001)
Alford-Gilkeson Award, Harvey Mudd College (2000)
DePietro Fellowship (2000)
Tau Beta Pi California Omega chapter Vice President (1999-2000)
Davies Engineering Award, Harvey Mudd College (1998)
General Motors Scholar (1998-9)
Harvey S. Mudd Scholar (1997-2001)