Joshua Philip Switkes
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OVERVIEW

Experienced proven technical contributor and leader in complex automotive system research and development with venture-capital backed startup experience.

EDUCATION

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

- Developed, implemented and tested lateral vehicle control system on steer-by-wire and electric vehicles. Included theory and hardware and software implementation.
- Coursework focus on Dynamic Systems and Control, Vehicle Dynamics and Optimization. National Science Foundation Graduate Fellowship

Harvey Mudd College, Claremont CA. B.S. in Engineering, May 2001 with Distinction and Departmental Honors, Harry Williams award in Mechanics, DePietro Fellowship.

AREAS OF EXPERTISE

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

EXPERIENCE

Tula Technology, Santa Clara, CA.

Member of Technical Staff June 2008 - Present

- Led control systems development from day one for VC-funded startup
- Built team to prototype novel combustion engine control method
- Technical leadership and personal contribution in control algorithms, signal processing, system modeling, testing methodologies
- Delivered alpha prototype in 4 months and full prototype in 10months

Volkswagen Electronics Research Lab, Palo Alto, CA.

Senior Staff Engineer Fall 2007 – June 2008
Senior Engineer Fall 2006 - Fall 2007
Visiting Scholar, Stanford Fall 2007 – Fall 2008

- Designed and implemented control algorithms for production Driver Assistance System for Audi vehicle. Developed algorithms and managed US budget for project, communication with Germany. Multiple patents in process.

- Researched and transferred new sensing, estimation and control technology to Audi Series Development systems (stability control, collision avoidance, etc.) Multiple patents in process.
    - As project Manager, managed project with Stanford University, VW Research and Audi Development. Managed team of 5 in Palo Alto.
- Scouted novel Silicon Valley technologies for German Volkswagen vehicle group.
- Responsible for intern hiring program, including recruiting, interviewing, and mentoring.

Dynamic Design Lab, Stanford University. Developed active lanekeeping assistance for automotive applications. Fall 2001-Fall 2006. National Science Foundation Graduate Fellowship

- Implemented and demonstrated real-time path tracking using GPS/INS and Steer-by-wire
- Developed, validated model of vehicle and handwheel for steer-by-wire force feedback.
- Designed and Implemented handwheel force feedback hardware for steer-by-wire in Corvette test vehicle and in immersive driving simulator.

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

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

SELECTED PUBLICATIONS

J.P. Switkes, E.J. Rossetter, J.C. Gerdes. *A Performance Guarantee for Active Lanekeeping Assistance with force Feedback* submitted to Journal of Dynamic Systems Measurement and Control.

J.P. Switkes, J.C. Gerdes. *Guaranteeing Stable Lanekeeping Near the Friction Limits Using Computed Polynomial Lyapunov Functions*. Submitted to IEEE Transactions on Automatic Control.

D. Langer, J.P. Switkes, A. Stoschek, B. Huhnke. *Environment Perception in the 2007 Urban Challenge: Utility for Future Driver Assistance Systems*. Workshop Fahrerassistenzsysteme, Walting, Germany, April 2008.

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.

J.P. Switkes, E.J. Rossetter, J.C. Gerdes. *Handwheel Force feedback for Lanekeeping Assistance: Combined Dynamics and Stability*, Journal of Dynamic Systems Measurement and Control, September 2006, v.128, no. 3, p. 532-542.

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.