DEPARTMENT OF MECHANICAL ENGINEERING
Purdue School of Engineering and Technology

FALL 2004 SEMINAR SERIES

Date: Thursday, October 21, 2004

Time: 11:00 am - 12:00 pm
Room: SL 165

Reception at 10:45 am (cookies and refreshments served)
Everyone is invited

Development of a Hybrid Brake-By-Wire System

Dr. Sohel Anwar
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Abstract. This presentation will cover the development of a hybrid Brake-By-Wire (BBW) system for an automobile. The brake-by-wire system under investigation includes a set of eddy current electric machines, a driveline mounted generator, an electro-hydraulic brake system, and a pedal force control system. The control algorithms include electronic brake force distribution, independent wheel torque control, brake torque blending, pedal force control, panic brake assist, closed loop torque control for electro-hydraulic actuators (e.g. pump and valves) and eddy current machines, driveline generator control / battery power management, regenerative braking, and vehicle dynamics control algorithms including anti-lock braking algorithm, yaw stability control, & brake-based traction control systems. The presentation will focus on an overview of the hybrid BBW system and then briefly describe the development of a sliding mode type anti-lock braking control algorithm for the proposed BBW system. Experimental results will be presented. A video clip illustrating the anti-lock braking performance for the hybrid BBW system will also be presented.

About the Speaker. Dr. Anwar is an Assistant Professor in the Mechanical Engineering Department at IUPUI, Indianapolis, IN. Dr. Anwar has a Ph.D. degree in Mechanical Engineering from University of Arizona (1995). Before joining IUPUI (2004), Dr. Anwar was with the Chassis Advanced Technology Department of Visteon Corporation, Dearborn, Michigan (1999-2004). At Visteon, Dr. Anwar specialized in research in the Mechatronics aspect of Drive-by-Wire Systems (e.g. Brake-By-Wire). He received nomination for the prestigious "Leading the Way" Award for his contribution in the development of Visteon Interactive Chassis Simulator (2003). Before joining Visteon, Dr. Anwar worked for Caterpillar, Inc. in the Technical Services Division in Peoria / Aurora, IL (1995-1999). At Caterpillar, Dr. Anwar was involved in the research and development of ground-speed control system for large wheel-loaders, implement-by-wire system for medium wheel-loaders, and traction control system for log-skidders. At IUPUI, Dr. Anwar's research will focus in the area of Mechatronics and Intelligent Systems.