

Adam Cardi, Ph.D.
Senior Associate

Professional Profile

Dr. Adam Cardi is a Senior Associate in Exponent's Technology Development practice. He has a background in experimental modal analysis, signal processing, machine design, and control systems design.

At Exponent, Dr. Cardi has mainly supported efforts in GPR (Ground Penetrating Radar), a vehicle-mounted system to detect IEDs buried in the ground. He has worked on automated detection algorithms, basic circuit board design, and various mechanical hardware design aspects of the system.

For his Ph.D. research at Georgia Tech, Dr. Cardi developed analytical models that could be used to predict cutting forces in metal turning operations. One application of these models was to predict chatter—an undesirable phenomenon whereby the workpiece vibrates violently with respect to the cutting tool in certain machining configurations. Prior to his graduate studies, Dr. Cardi performed research in load identification and structural health monitoring both as an undergraduate at Purdue University and as an intern at Los Alamos National Laboratory. Here he developed a novel algorithm for a portable system embedded in a soldier's bulletproof armor vest to predict the location and magnitude of a ballistic impact using acceleration measurements.

Academic Credentials and Professional Honors

Ph.D., Mechanical Engineering, Georgia Institute of Technology, 2009

M.S., Mechanical Engineering, Georgia Institute of Technology, 2008

B.S., Mechanical Engineering, Purdue University, 2005

Publications

Cardi AA, Bement MT, Liang SY. A geometrically comprehensive approach to modeling dynamic cutting forces in turning: Application to regenerative chatter. International Conference on Manufacturing Science and Engineering, 2008.

Cardi AA, Bement MT, Liang SY. Workpiece dynamics during stable cutting in a turning operation. The International Journal of Machine Tools and Manufacture 2008; 3(4):406–424.

Cardi AA, Firpi HA, Bement MT, Liang SY. Workpiece dynamic analysis and prediction during chatter of turning process. Mechanical Systems and Signal Processing 2008; 22(6):1481–1494.

Cardi AA, Bement MT, Liang SY. Effect of tool nose radius on the chatter instability of oblique machining. Proceeding, International Conference on Advanced Manufacturing Technology 2007, Tainan, Taiwan, 2007.

Cardi AA, Kosbab BD, Overly TG, Schultze JF, Bement MT. Damage assessment through control feedback expansion of modal space. Proceedings of the 24th International Modal Analysis Conference, Saint Louis, MI, 2006.

Cardi AA, Adams DE, Walsh S. Locating and quantifying ceramic body armor impact forces on a compliant torso using acceleration mapping. Proceedings, SPIE – Health Monitoring and Smart Nondestructive Evaluation of Structural and Biological Systems 2006; 6177:617714.

Cardi AA, Adams DE, Walsh S. Ceramic body armor single input force identification on a compliant torso using acceleration response mapping. Structural Health Monitoring – An International Journal 2006; 5(4):355–372.

Prior Experience

Research Assistant, Precision Machining Research Consortium, Georgia Tech School of Mechanical Engineering, 2005–2009

Researcher, Modal Analysis Laboratory, Purdue University, 2005

Intern, Los Alamos National Laboratory, Summer, 2005

Intern, American Cast Iron Pipe Company, Summer, 2004