

---

## Experience

**Drexel University - ENGR202: Evaluation and Presentation of Experimental Data** **Philadelphia, PA**  
*Teaching Assistant* *January 2010 - March 2013*

- Course introduces sophomore students to rigorous data collection by designing and analyzing a beam scale. Conducted labs requiring students to work with strain gauges and data acquisition, accounting for temperature and noise error. Taught students how to build simple LabVIEW VI's to interface with their beam scale. Received consistent positive feedback from students about teaching style and office hours. The summer/2012 term saw a total redesign of the course; contributed MATLAB code and tutorials to read and filter data from an accelerometer. Emphasized good coding practices as well as practical shortcuts in the curriculum.

**Drexel Autonomous Systems Lab** **Philadelphia, PA**  
*Lab Manager* *June 2009 - April 2012*

- Oversaw daily operations of the Drexel Autonomous systems lab, which included purchasing, maintenance, inventory, and travel organization. Oversaw a complete overhaul of machine shop facilities in the lab, as well as equipment storage and organization.

**Drexel University - ENGR101, 102, 103: Freshman Design Sequence** **Philadelphia, PA**  
*Teaching Assistant* *September 2010 - June 2012*

- Introduced freshman students to basic engineering principles and design methods using MATLAB, Lego NXT Robotics, and LabVIEW. Taught students how to analyze and break down problems to both troubleshoot and improve their designs. Despite being new to the field, students were able to build and deploy sophisticated Lego NXT robots, control a balancing platform with an accelerometer, and reverse engineer/improve a camera. Advised over 15 freshman design groups on robotics, who participated in competitions like robotic firefighting and autonomous robot soccer.

**Drexel University - MEM351: Dynamic Systems Lab** **Philadelphia, PA**  
*Teaching Assistant* *June 2008 - September 2010*

- Course introduces linear controls design using MATLAB simulation and hardware experiments. Conducted laboratory lectures, guided student experiments, and graded homework / reports. During Summer/2009 term, designed and conducted course materials including lectures and web resources.

**Drexel University - MEM423: Analysis of Vibrations** **Philadelphia, PA**  
*Teaching Assistant* *June 2006 - September 2007*

- Graded homework and conducted exam review for students. Coordinated examination study group and review session.

**Cemex, Inc** **Exton, PA**  
*Assistant Project Engineer* *September 2003 - March 2004*

- Developed computational fluid dynamic models of air flow through cement plants using GAMBIT and Fluent software. Visited plant sites to validate flow models, and to perform an on-site experiment to improve NOx emissions. Developed proof-of-concept duct designs for two cement plants undergoing retrofit.

**Lockheed Martin MS2** **Moorestown, NJ**  
*Assistant Process Engineer* *September 2005 - March 2006*

- Worked on shock-hardening of computer cabinets for US Naval ships. Used Pro/Engineer to model lightweight protective covers for rack servers, as well as a finite-element model of a shock test fixture using ANSYS and Pro/Mechanica. Developed a shock isolator sizing calculator using Excel and VBA to speed design of isolation springs.

**Drexel Integrated ATV System 2, Drexel University**

**May 2006 - August 2006**

- Designed, manufactured, and assembled servo-actuated steering system for vehicle chassis. The DIAS2 project enhanced a stock all-terrain vehicle with servo-control of the steering, throttle, brakes, and transmission. At the flip of a switch, an embedded PC could assume control of the ATV, performing GPS waypoint navigation.

**Self-balancing Hands-Free Transport (SHIFT), Drexel University**

**September 2006 - June 2007**

- Designed, built, and tested a self-balancing personal transport. Unlike similar modes of transportation (ex. Segway), the SHIFT design used only pedal input, freeing an operators hands to interact with the environment. Modeled system dynamics using Maple and MATLAB, designed the electrical power and sensor systems, and implemented a DSP-based controller. Machined and assembled aluminum frame and servo drivetrain.

**East Asia / Pacific Summer Institutes**

**June 2007 - September 2007**

- Learned basics of bipedal walking, including zero moment point (ZMP) control, Kane's dynamics methods, and simulation of 2D bipedal walking. Worked with KAIST's Hubo humanoid robot, including complete assembly and joint repair. Experience and relationships with lab members prompted five additional visits over the last five years.

**OpenHubo Simulation Package for Hubo Robot, Drexel University**

**February 2011 - December 2012**

- Using the Open Robotics Automation Virtual Environment (OpenRAVE), designed and developed a dynamic simulation for the Hubo humanoid. Accurate mass distributions were obtained from detailed CAD geometry. Complex robot geometry is efficiently represented as a convex decomposition, allowing fast collision detection. Whole-body motions are planned in OpenHubo, and simulated with an improved version of the Open Dynamics Engine (ODE). Finally, motions can be sent directly to the Hubo hardware for experiments. OpenHubo was written in C++ and python, and is compatible with MATLAB.

**Education**

**Drexel University**

*Doctor of Philosophy, Mechanical Engineering (GPA: 3.79)*

**Philadelphia, PA**

*Expected June 2013*

**Drexel University**

*Bachelor of Science, Electrical Engineering (GPA: 3.71)*

**Philadelphia, PA**

*June 2007*

**Drexel University**

*Bachelor of Science, Mechanical Engineering (GPA: 3.7)*

**Philadelphia, PA**

*June 2010*

**Skills**

**Software:** Git, Matlab, Pro-E, Simulink, Visual Studio .NET, SolidWorks, OrCAD, MS Office, MS Project

**Shop Skills:** Tormach PCNC 1100 CNC Mill, Manual Mill, MIG & TIG Welding, Manual Lathe, Verticle Bandsaw, Horizontal Bandsaw, Drill Press, injection molding experience, Power Tools, PCB Milling, Hand Tools

**Languages/Operating Systems:** Fortran, GCode, C#, Java, Assembly, Visual Basic, C++, Visual C++, Windows, MacOS, Linux, Labview

**Equipment:** Scanning Laser Range Finders, Scanning Laser Vibrometer, Oscilloscope, Function Generator, Power Supplies, Network Analyzer, Circuit Construction

## Honors

- Presidential Scholar 2002 - 2007
  - Jack and Gretchen Jenofsky Scholarship 2002 - 2007
  - Graduated with Honors, Electrical Engineering June 2007
  - Graduated Magna Cum Laude, Electrical Engineering June 2007
  - Best paper award for 'Control Technologies and Applications' IMETI 2009 2009
- 

## Publications

- Ellenberg, R.; Grunberg, D.; Kim, Y.; Oh, P. "Exploring Creativity Through Humanoids and Dance". 5th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI). Seoul, South Korea. Nov. 2008.
- Ellenberg, R.; Sherbert, R.; Oh, P.; Alspach, A.; Gross, R.; Oh, J. "A Common Interface for Humanoid Simulation and Hardware". 10th IEEE-RAS International Conference on Humanoid Robots. Dec. 2010.
- Ellenberg, R.; Grunberg, D.; Oh, P.; Kim, Y. "Creating an Autonomous Dancing Robot". Proceedings of the International Conference on Hybrid Information Technology. Aug. 2009.
- Grunberg, D.; Ellenberg, R.; Kim, Y.; and Oh, P. "From RoboNova to Hubo: Platforms in Robot Dance". Proceedings of the International Conference of Advanced Humanoid Robotics Research (ICAHRR). Aug. 2009.
- Ellenberg, R.; Grunberg, D.; Oh, P.; Kim, Y. "Using Miniature Humanoids as Surrogate Research Platforms". 9th IEEE-RAS International Conference on Humanoids, pp.175-180, 7-10. Dec. 2009.
- Jun, Y.; Ellenberg, R.; Oh, P. "From Concept to Realization: Designing Miniature Humanoids for Running". Proceedings of The 2nd International Multi-Conference on Engineering and Technological Innovation: IMETI 2009, Florida. June 2009.
- Grunberg, D.K.; Ellenberg, R.; Kim, I.H.; Oh, J.H.; Oh, P.; Kim, Y.E. "Development of an Autonomous Dancing Robot". International Journal of Hybrid Information Technology. 2010.
- Jun, Y.; Ellenberg, R.; Oh, P. "Realization of Miniature Humanoid for Obstacle Avoidance with Real-Time ZMP Preview Control Used for Full-Sized Humanoid". 2010 IEEE-RAS International Conference on Humanoid Robots: Humanoids 2010, pp46-51, Nashville, TN, USA. Nov. 2010.
- Lofaro, D.; Ellenberg, R.; Oh, P. "Interactive Games With Humanoids: Playing With Jaemi Hubo". 2010 IEEE-RAS International Conference on Humanoid Robots: Humanoids 2010, Nashville, TN. Nov. 2010.
- Lofaro, D.; Ellenberg, R.; Oh, P.; Oh, J.H. "Humanoid Throwing: Design of Collision-Free Trajectories with Sparse Reachable Maps". IEEE/RSJ International Conference Intelligent Robots and Systems (IROS). 2012.
- Sevcik, K.; Shah, S.; Collins, J.; Moran, A.; Ellenberg, R.; Perreca, M.; Oh, P. "Project DIAS: Drexel's Integrated ATV System". American Assoc. for Artif. Int. (AAAI), Boston MA. July, 2006.