

Research Interest My research interests lie primarily in Humanoid Robotics, Complex Control Systems and Robotics with most recent ventures relating to Robot Design and Cloud Robotics.

Education **Drexel University** 2008 - 2013
PhD in Electrical and Computer Engineering in Control Systems and Robotics. Dissertation Title: *Unied Algorithmic Framework for High Degree of Freedom Complex Systems and Humanoid Robots* Advisor: Dr. Paul Oh

Drexel University 2006 - 2008
Masters in Electrical and Computer Engineering in Control Systems Graduated with Honors
Thesis Title: *Control Design to Reduce the Effects of Torsional Resonance in Coupled Systems*

Drexel University 2003 - 2008
Bachelor of Science in Electrical and Computer Engineering in Control Systems Graduated Cum Laude and with Honors

Fellowships and Awards **NSF-GRFP Honorable Mention** 2009
The program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees in the U.S. and abroad.

NSF-EAPSI Fellow 2008
The primary goals of EAPSI are to introduce students to East Asia and Pacific science and engineering in the context of a research setting, and to help students initiate scientific relationships that will better enable future collaboration with foreign counterparts.

Lester Kraus Award 2008
Awarded to Electrical Engineering student who has shown the greatest promise of developing into a creative and socially responsible engineer.

Dean's Fellowship 2008
Non-need-based award for full-time graduate students designed to assist outstanding applicants.

Programming **Proficient Languages:** C/C++, Python, MATLAB, Java, C#, LabView
Platforms and OS: Linux, Windows
Computer Control Methods: Real-Time, Inter-Process Communication, Network Based Control

Lab Skills and Tools PCB Layout and Design, PCB Surface Mount Population, Soldering (Solder and Solder Paste)
Use of: Oscilloscopes, Spectrum Analyzers, Function Generators, Volt-Ohm Meters, Amp Meters, Jigsaws, Band Saws, Routers, Drills, etc. Carpentry skills include both metal working, wood working, and 3D printing.

Publications **Reliable Software for Humanoid Robots** RAM 2013
Authors: Dantam, N.; Lofaro, D.; Hereid, A.; Oh, P.; Ames, A.; Stilman, M.
IEEE Robotics and Automation Magazine

A lightweight, cross-platform robot visualization using the cloud IROS 2014
Authors: Hilton, W.; Lofaro, D.; Kim, Y.
Intelligent Robots and Systems (IROS), 2014 IEEE/RSJ International Conference

- From autonomy to cooperative control of humanoid manipulation ...** IROS 2014
 Authors: J. Mainprice, C. Phillips-Graffin, H. Suay, N. Alumni, D. Lofaro, D. Berenson, S. Chernova, R. Lindeman, and P. Oh,
 Intelligent Robots and Systems (IROS), 2014 IEEE/RSJ International Conference
- Unified algorithmic framework for DOF complex systems...** Dissertation 2013
 Authors: Lofaro, D.
 Doctoral Dissertation, Electrical and Computer Engineering Department, Drexel University
- Multi-Process Architecture for Robust Control the Hubo2+ Robot** TePRA 2013
 Authors: Grey, M.; Dantam, N.; Stilman, M.; Lofaro, D.
 IEEE International Conference on Technologies for Practical Robot Applications
- Toward A User-Guided Manipulation Framework for High-DOF...** TePRA 2013
 Authors: Alumni, N.; Phillips-Graffin, C; Suay, H.; Lofaro, D.; Berenson, D.
 Chernova, S; Lindeman, R; Oh, P.;
 IEEE International Conference on Technologies for Practical Robot Applications
- Humanoid Pitching at a Major League Baseball Game** Humanoids 2012
 Authors: Lofaro, D.; Sun, C.; Oh, P.;
 Humanoid Robots (Humanoids), 2012 10th IEEE-RAS International Conference
- A n-dimensional Convex Hull Approach for Fault Detection** ICCAS 2012
 Authors: Lofaro, D.; Lynch, K. Oh, P.;
 International Conference on Control, Automation and Systems
- Design of Collision-Free Trajectories with Sparse Reachable Maps** IROS 2012
 Authors: Lofaro, D.; Ellenberg, D. Oh, P.; Oh, JH.;
 Intelligent Robots and Systems (IROS), 2012 IEEE/RSJ International Conference
- Humanoid Throws Inaugural Pitch at Major League Baseball Game** URAI 2012
 Authors: Lofaro, D.; Oh, P.;
 International Conference on Ubiquitous Robotics and Ambient Intelligence
- Design of Humanoids as Interactive Musical Participants** IASTED 2011
 Authors: Lofaro, D.; Grunberg, D. Oh, P.; Kim, Y.; Oh, J.;
 International Association of Science and Technology (IASTED), 2011
 International Conference on Robotics
- Robot Audition and Beat Identification in Noisy Environments** IROS 2011
 Authors: Grunberg, D.; Lofaro, D. ; Oh, J.; Kim, Y;
 Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference
- Towards a musically-aware humanoid for interactive music...** EURASIP 2011
 Authors: Kim, Y.; Lofaro, D; Batulaa, A; Grunberg, D;
 EURASIP Journal on Audio, Speech, and Music Processing
- Visual Beat Tracking: A Novel Approach to Tempo Tracking...** Humanoids 2010
 Authors: Lofaro, D.; Oh, P.; Oh, J.; Kim, Y.;
 Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference
- Interactive Games With Humanoids: Playing With Jaemi Hubo** Humanoids 2010
 Authors: Lofaro, D.; Ellenberg, R.; Oh, P.;
 Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference
- Developing Humanoids for Musical Interaction** IROS 2010
 Authors: Kim, Y.; Batula, A.; Grunberg, D.; Lofaro, D. ; Oh, J.;
 Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference
- Mechatronics Education: From Paper Design to Product Prototype...** FIRA 2009
 Authors: Lofaro, D.; Le, T.; and Oh, P.;
 Progress in Robotics, ser. Communications in Computer and Information Science

- Work Experience**
- George Mason University** Assistant Professor
Fairfax, VA January 2014 - Present
Assistant Professor in Robotics at George Mason University in the Electrical and Computer Engineering Department.
- George Mason University** Laboratory Director
Fairfax, VA January 2014 - Present
Director of the Lofaro Labs at George Mason University. The primary focus of the lab is robotics including Humanoids and Complex Control Systems with most recent ventures relating to Robot Design and Cloud Robotics. Focus on science infused art/music and STEM outreach is also a big part of the Lofaro Labs' mission.
- DARPA Robotics Challenge Track A Team: DRC-Hubo** Research Lead
Philadelphia, PA July 2012 to December 2013
Research Lead and Systems Engineer for the Track-A DARPA Robotics Challenge team DRC-Hubo. I work directly with Dmitry Berenson at WPI on the valve opening/closing task of the challenge. In collaboration with Mike Stilman and Neil Dantam at Georgia Tech I lead the developed of the needed open-source, Linux based, BSD licensed controller for humanoid robots. Our software is the primary control system for the DRC-Hubo team and is currently being used by MIT, WPI, Purdue, Ohio State, Swarthmore College, Georgia Tech, and Drexel University. Team Website: <http://www.drc-hubo.com>
- Drexel Autonomous Systems Lab** Research Assistant
Philadelphia, PA April 2008 to December 2013
Researching Complex Control Systems and Robotics. Daniel's dissertation topic is end-effector velocity control for bipedal robots, also known as throwing. Primary care taker of the full-size humanoid robot Jaemi Hubo.
- Dragonfly Incorporated** Engineer
Philadelphia, PA April 2011 to Present
Testing and modeling of linear actuators for dual rotor unmanned aerial vehicles.
- Drexel University** Teaching Assistant
Philadelphia, PA April 2008 to Present
Assist professor with electrical engineering lab courses as well as organizing and maintaing Senior Design for the electrical and computer engineering dept.
- IEEE (ICRA 2012)** Intl conf origination, web des
Piscataway, NJ May 2011 to July 2012
Design and maintain events and website for the International Conference on Robotics and Automation.
- NATO (ASI-2012)** Technical/Workshop Chair
Cesme, Turkey August 2009 to November 2010
Organize and maintain 6 workshops for an international audience with participation from 23 countries
- FIRST Robotics** Mentor, Judge, and Volunteer
Villanova, PA March 2006 to June 2010
Coach/mentors for the all girls high school, Agnes Irwin School (Bryn Mawr, PA), FIRST Robotics team and Philadelphia Regional Competition volunteer.
- Moog Component Group** Assistant Design Engineer
Springfield, PA August 2005 to March 2006
Temperature response testing - Error analysis on positional and rotational actuators - Fault detection circuit design and implementation for positional and rotator actuators - PCB trace verification, Trained in MIL-SPEC soldering.
- Evaporated Coatings Inc.** Vacuum Deposited Thin Film Assistant Design Engineer

Willow Grove, PA

August 2004 to March 2005

Design and implementation of vacuum deposited tin films for the control of optical, thermal and electrical surface properties, design using computer simulations. Implementation via vacuum deposition using electron beam gun.

- Invited Talks and Demonstrations**
- Disney Research - Pittsburgh, PA** Winter 2014
Talk Title: DARPA Robotics Challenge, Next Steps Forward
- University of Zagreb - Zagreb, Croatia** Fall 2014
Talk Title: Team DRC-Hubo: International Collaboration using a Three Phase Design Cycle
- Bryn Mawr College - Bryn Mawr, PA** Fall 2014
Talk Title: Building a robot club from the ground up (Part 2)
- Society of Woman in Engineering (SWE) Invited Talk - Fairfax, VA** Fall 2014
Talk Title: I can robot, and you can too - a cheat sheet for getting your Ph.D
- Los Alamos National Laboratories - Los Alamos, NV** Summer 2014
Talk Title: Team DRC-Hubo: International Collaboration using a Three Phase Design Cycle
- Chung-Ang University - Seoul, S. Korea** Summer 2014
Talk Title: Team DRC-Hubo: A US-Korea Collaboration
- GMU Korea - Incheon, S. Korea** Summer 2014
Talk Title: Team DRC-Hubo: A US-Korea Collaboration
- Bryn Mawr College - Bryn Mawr, PA** Spring 2014
Talk Title: Building a robot club from the ground up (Part 1)
- Cornell University - Ithaca, NY** Fall 2013
Talk Title: Team DRC-Hubo: A road-map to the DARPA Robot Challenge
- University of Pennsylvania - Philadelphia, PA** Spring 2013
Talk Title: DARPA Robot Challenge: The DRC-Hubo Team - Where we are and what we are doing.
- Columbia University - New York, NY** Fall 2012
Demonstration: Hands on demonstration of the Hubo2+ humanoid robot. Following the demonstration there was a in depth Q&A session with the graduate and undergraduate students in the college of engineering.
- Maker Faire - New York, NY** Fall 2012
Demonstration: Showed the inner-workings of Hubo the humanoid robot to the do it yourself (DIY) community.
- ASME - Drexel University - Philadelphia, PA** Summer 2012
Talk Title: Humanoid Pitching at a Major League Baseball Game: Challenges, Approach, Implementation and Lessons Learned
- Philadelphia Phillies and Philly Science Festival - Philadelphia, PA** Spring 2012
Demonstration: Developed a system to make Hubo become the first full-size humanoid robot to successfully throw the inaugural pitch at a Major League Baseball game, Philadelphia Phillies vs. Chicago Cubs. 45,196 spectators according to the USA Today.
Video: <http://danlofaro.com/projects/philliesGame/>
- Friends of the Free Library - Philadelphia, PA** Spring 2012
Talk Title: Humanoid Robots, they are fun!
Included live hands-on demonstration of a miniature humanoid.
Purpose what to get the inner city students exposed to advanced robotics.
- Sugartown Elementary School - Sugartown, PA** Winter 2011
Demonstration: Hands on demonstration and interactive sessions of ground vehicles, pick and place robots and miniature humanoids for elementary school students.

- Philcon 2011 - New Jersey, NJ** Fall 2011
 Talk Title: Humanoid robots, a step in the right direction?
 About Philcon: Started in 1936, Philcon features cutting-edge programming about literature, art, television, film, anime, comics, science, gaming, costuming and cosplay, music, and other topics of interest to fans of sci-fi, fantasy, and horror.
- State Senator Invitation - 5th Annual Carole Smith Technology Symposium - Philadelphia, PA** Fall 2011
 Talk Title: Humanoid Robots, Past, Present, Future. 5th Annual Carole I Smith Technology Symposium. Presented by State Senator LeAnna M. Washington, Hosted by Temple University
- Daegu Institute of Science and Technology - Daegu, South Korea** Spring 2011
 Talk Title: Interactive Games With Humanoids.
- Korean Advanced Institute of Science and Technology (KAIST) Daejeon, South Korea** Spring 2011
 Talk Title: Interactive musical participation with humanoid robots through the use of novel musical tempo and beat tracking techniques in the absence of auditory cues.
- Hanyang University - Seoul, South Korea** Spring 2011
 Talk Title: Visual Beat Tracking
- MY Robotics Club, Bryn Mawr College - Bryn Mawr, PA** Winter 2010
 Talk Title: Humanoid Robots, Past, Present, Future
- Philadelphia Please Touch Museum - Philadelphia, PA** Spring 2009
 Demonstration: Live hands on demonstration for children and adults ages 3 to 99.

Extracurricular Activities

- IEEE-Humanoids 2012 Student Activity Board Event Organizer** 2012
 Designed and implemented student socials and activities for the IEEE-Humanoids 2012 conference in Osaka, Japan. This included organizing daily group lunch and dinners for students, Karaoke night, a day trip to Kyoto, and a Student Banquette. My over all purpose for these events is to “*create an atmosphere conducive for students to get to know each other in a non-academic setting.*” Website: <http://humanoids2012.danlofaro.com/>
- IEEE-ICRA 2012 Student Activity Board Event Organizer** 2012
 Designed and implemented student socials and activities for the IEEE-ICRA 2012 conference in St. Paul, MN. This included a student dinner with a comedian as well as daily events and activities. My over all purpose for these events is to “*create an atmosphere conducive for students to get to know each other in a non-academic setting.*” Website: <http://icra2012.org/student/>
- Senior Design Robot Competition** 2009 - 2011
 Designed, implemented, and coached a robot competition for senior students in the Drexel University Senior Design class. The competition consisted of multiple teams and multiple robots. Each robot was less then 1.0m x 1.0m x 1.0m and less then 10kg.
- Indoor Aerial Robotics Competition** 2008 - 2011
 Designed and implemented the Indoor Aerial Robotics Competition from 2008-2011. The IARC was formed in 2005 by Dr. Paul Oh in parallel with the Congressional mandate that requires 30% of all U.S. deep-strike aircraft to be capable of autonomous navigation by 2015. To keep in line with this mandate, the competition was revised to increase the difficulty each year with the goal of having a “backpack-able” vehicle that flies autonomously inside buildings by 2015.
- CoE Engineers Week Annual Egg Drop Competition** 2007 - 2011
 The Egg Drop competition challenges student, faculty, and professional staff teams to create a recyclable contraption that will protect a large Grade A egg from a free fall of 40 feet or from it gliding down a steel zip line and crashes into a target more than 30 feet below. Scoring is based on a mathematical formula that calculates weight and speed.
- IEEE Student Branch Technical Chair** 2006 - 2008
 Drexel University’s IEEE Branch Technical Chair. Designed events and activities for IEEE student branch.

Eita-Kappa-Nu Popsicle Stick Bridge Contest

2008 - 2009

The goal of this competition is to build the least expensive bridge that can span a 12 inches gap, have a width of at least 3 inches, and hold a load at its center using only the materials listed below. The functioning bridge with the lowest materials cost wins. Please note that this competition is geared towards middle school students to teach them some of the basics of engineering.

Biannual IEEE Lego Robot Competition

2006 - 2008

Design and implementation of the bi-annual Lego robot competition. The competition has the expressed goals of enforcing the knowledge the electrical and computer engineering students have learned in class including robot design, logic and autonomous systems.

ONR SeaPerch Challenge (regional and national competition)

2009-2011

Judge for high school student robot competition. The SeaPerch Program provides students with the opportunity to learn about robotics, engineering, science, and mathematics (STEM) while building an underwater ROV as part of a science and engineering technology curriculum. Throughout the project, students will learn engineering concepts, problem solving, teamwork, and technical applications.