William E. Green

Current Position
Ph.D. Candidate
Mechanical Engineering
Drexel University
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Professional Preparation

Ph.D.	Drexel University, Pennsylvania	Mechanical Engineering	June 2007 (exp.)
M.Sc.	Drexel University, Pennsylvania	Mechanical Engineering	2004
B.Sc.	Drexel University, Pennsylvania	Mechanical Engineering	2002 (Honors)

Research Experience

Micro Air Vehicle to Fly in Caves, Tunnels and Buildings

A fixed-wing MAV, which flies like an airplane and hovers like a helicopter, was developed for autonomous surveillance and reconnaissance in caves, tunnels, and buildings. A modular flight control system was designed and integrated with an inertial measurement unit to achieve the first documented success of autonomously hovering a fixed-wing MAV. The low-level quaternion attitude controller serves as the foundation for higher-level controllers currently being developed for collision avoidance in cluttered environments. *Acquired Skills*: Quaternion attitude control, PCB design, and GPS waypoint navigation.
http://www.pages.drexel.edu/~weg22/fwHovering/fixedWingHovering.html

Closed Quarter Aerial Robotics (CQAR)

Developed an aerial platform to fly in and around buildings. An optic flow sensor suite mimicking insect flight stratagems was also used to achieve autonomous tasks such as landing and collision avoidance. *Acquired Skills*: Aircraft and control system design, microcontroller programming, and optic flow theory.

Civilian Medical Response Center (CIMERC) Project

Real-time image processing algorithms such as edge detection were used to communicate ingress and egress routes to emergency response teams. *Acquired Skills*: Computer vision and image processing techniques, wireless video, and 802.11 networking.

Professional Experience

Lockheed Martin's Advanced Technology Labs *Cherry Hill, NJ* July–September 2003

Applied vision-based algorithms enabling a ground robot to search for and locate biohazardous symbols and also to differentiate between team members and a human sentry.

MaGrann Associates *Mt. Laurel, NJ* Sept–March 2000
Sept–March 2001

Designed residential heating/cooling duct systems; performed residential load and energy code analysis; responsible for residential predrywall and presettlement inspections.

Teaching Experience

Instructor *Simultaneous Localization and Mapping (SLAM)* Summer 2006

Attended the 2006 SLAM Summer School, which was a week long program held at the University of Oxford. Students were introduced to several techniques including EKF SLAM, vision-based SLAM, subsea SLAM, etc. Using the acquired knowledge, I created a short course on SLAM and instructed several graduate students on the theory and implementation behind the technology.
http://prism2.mem.drexel.edu/~billgreen/slam/slam.html

Instructor	*Dynamic Systems and Control (MEM 351)*	Summer 2006

Instructed students on the analysis and control of dynamic systems through advanced simulation and experimental methods. This included in-class experiments on sensors, actuators, microcomputer data acquisition and feedback control systems.

Instructor	*Dynamic Systems and Control (MEM 351)*	Summer 2005
Teaching Assistant	*Dynamics (MEM 238)*	Summer 2003
Teaching Assistant	*Engineering Design & Lab (tDEC 130-133)*	2003–2004
Teaching Assistant	*Engineering Design & Lab (tDEC 130-133)*	2002–2003

Awards and Honors

2005	Lockheed Martin – George Law Fellowship (1 year) – awarded to graduate students in Mechanical Engineering for academic merit
2004	Koerner Fellowship, Drexel University (1 year) Honorable Mention, NSF Graduate Research Fellowship
2003	Honorable Mention, NSF Graduate Research Fellowship **Best Paper Award in Robotics**, CCCT Conference
2002	Dean's Fellowship, Drexel University (5 years) Graduated with Honors – Magna Cum Laude
1999	Inducted into Golden Key National Honor Society
1998	Inducted into Pi Tau Sigma Mechanical Engineering Honor Society Inducted into Phi Eta Sigma National Honor Society
1997	A.J. Drexel Scholarship, Drexel University (5 years) – awarded to top 10% of incoming freshman

Publications

The following is a selective list of 18 refereed conference papers, journals, and book chapters in the areas of control systems, sensing and collision avoidance, and aircraft design.

1. Green, W.E., Oh, P.Y., "The Integration of a Multimodal MAV and Biomimetic Sensing for Autonomous Flight in Near-Earth Environments," *Advances in Unmanned Aerial Vehicles*, ed. K. Valavanis, Springer Verlag, Berlin, 2007 (in press).
2. Green, W.E., Oh, P.Y., "Optic Flow Based Collision Avoidance on a Hybrid MAV," *IEEE Robotics and Automation Magazine*, 2007 (in press).
3. Green, W.E., Oh, P.Y., Barrows, G., "Flying Insect Inspired Vision for Autonomous Aerial Robot Maneuvers in Near-Earth Environments," *IEEE International Conference of Robotics and Automation*, New Orleans, LA, pp. 2347-2352, April 2004.
4. Green, W.E., Oh, P.Y., "An Aerial Vision Platform for Acquiring Situational Awareness," *International Conference on Computer, Communication and Control Technologies*, Orlando, FL, v5, pp. 289-295, July 2003. **Received Best Paper Award in Robotics.**

Computer Skills

Systems	Windows, Mac OS, basic UNIX commands
Programming	C/C++/VB/Python/Basic/Matlab/Labview/HTML
CAD/Modeling	SolidWorks, AutoCAD, Cadkey
Simulation	Matlab/Simulink, Maple
Other	EAGLE, Canoma
Microcontrollers	Microchip PIC16–18 series, Parallax Basic Stamp
Hardware	Took 3 real-time microcomputer control courses detailing motor speed control, signal cond., filter design, A/D conversion, circuit prototyping, and TCP/IP programming.

Leadership and Service Experience

2005–2006	Engineering Graduate Association, Officer
2004–2005	Engineering Graduate Association, Officer
2005–present	Member of AUVSI Society
2003–present	Member of ASME Society
2003–present	Member of IEEE Society