**DYLAN J. KOENIG**

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## WORK EXPERIENCE

**Research and Engineering Intern,** Astrobotic Technology, Inc — 2013 - Present

- Created visual odometry software application for motion estimation of lunar lander in C++ from the ground up.
- The system takes in stereo camera image pairs, detects feature points in the current frame, and finds corresponding point locations in the subsequent frames using computer vision algorithms all in real-time at 10+ FPS.
- Currently working on FPGA implementation of this system to be used on board the lunar lander that will win the $30 million Google Lunar X-Prize in 2015.

**Structure and Design of Digital Systems 18-240 TA**, Carnegie Mellon University — 2013

**Engineering Intern**, OMNIlife Science; Manhattan, NY — 2011

- Designed, built, and implemented a system for measuring forces within a human knee intra-operatively. Please see http://tinyurl.com/kneesim for a brief video demonstration (links to youtube).
- Wrote software to analyze data acquired by the system. Features include pin pointing the center of force on the tibia, calculating medial and lateral antero-posterior force balance, and plotting force data all in realtime.
- Designed Oxford Knee Rig model using SolidWorks.

**Research Intern**, Hospital for Special Surgery's Computer Assisted Surgery Lab; Manhattan, NY — 2011

- Designed and implemented femur and tibia housings used to secure cadaver specimens to knee simulator.
- Conducted recently published study focusing on the "pivot shift" phenomenon within the human knee.

## PROJECTS

**Sleep Monitor**, Undergraduate Research Project — 2011 - 2012 (http://imgur.com/a/R8iPK - images of final device)

- Designed, prototyped, iterated, and finalized inexpensive hardware method used to measure a user's sleep motion.
- Designed in SolidWorks and 3D printed the device's custom housing.
- Attained IRB approval to conduct a study to both look at how our device stacks up against the "Gold Standard" as well as see if we can accurately detect sleep disorders/sleep cycles.

**Effortless I/O,** Undergraduate Research Project — 2012 - Present

- Winner of four Carnegie Mellon Meeting of the Minds awards, the most awards for one team in history:
  - Boeing Blue Skies: Game Changer, IBM Smarter Planet, Toyota Environmental Research, Johnson & Johnson Undergraduate Research Award (2nd place)
- Aided in the implementation of a system based around the ATMega microcontroller which allows a user to add internet connectivity and hardware communication to the AVR microcontroller family both easily and efficiently.
- The AVR can communicate with phones, computers, and other devices through a Javascript library over the internet/bluetooth, allowing the user to do things such as control an RC car via their smartphone.

**Mobot**, Annual Mobile Robot Competition — 2011 (http://imgur.com/a/tomCc - images of final device)

- Competed with 2 peers in order to create a robot capable of autonomously navigating a race track.
- Designed and constructed a means of securing Nexus One smartphone (the "brain" of the robot) to RC car.

## ACTIVITIES AND AFFILIATIONS

**Robotics Club**, Carnegie Mellon University — 2010 - Present
**Astronomy Club**, Carnegie Mellon University — 2010 - Present

## HONORS

**National Honor Society Member**, Jericho High School — 2008 - 2010
**AP Scholar with Honor**, Jericho High School

## EDUCATION

**Carnegie Mellon University; Pittsburgh, PA**

- Bachelor of Science in Electrical and Computer Engineering with Minor in Robotics, May 2014 — GPA: 3.32

**Jericho High School; Jericho, NY**

- June 2010 — GPA: 3.94/4.00

## RELEVANT COURSES AND SKILLS

- Advanced Digital Design 18-545 | Computer Architecture 18-447 | Advanced Mobile Robot Development 16-865 | Embedded Real-Time Systems 18-349 | Robot Kinematics 16-384 | Fundamentals of Control 18-370 | Logic Design Techniques 18-341 | Computer Systems 18-213 | Electronic Devices and Analog Circuits 18-220 | Computational Photography 15-463 | Principles of Imperative Computation 15-122 | 3D Calculus 21-259
- Proficient with C, SystemVerilog, Python, SolidWorks, MATLAB, and Linux/UNIX
- Familiarity with C++, ARM/Intel Assembly, HTML, CSS, LaTeX, AVR/Arduino programming/circuitry