DYLAN J. KOENIG

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WORK EXPERIENCE

Structure and Design of Digital Systems 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

- Adapted model knee simulator in order to accept cadaver knee specimens.
- 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.
- The hardware is based around the ATMega328p microcontroller and an accelerometer that is placed under the user's bed sheets.
- Designed in SolidWorks and 3D printed the device's custom housing.
- Currently installed in the UPMC Sleep Institute in a grant-funded study to test its effectiveness.
- 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

- 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: 3.11
Jericho High School; Jericho, NY
- June 2010 — Weighted GPA: 3.94/4.00

RELEVANT COURSES AND SKILLS

- Advanced Mobile Robot Development (16-865) | Embedded Real-Time Systems (18-349) | Logic Design Techniques (18-341) | Introduction to Robotics (16-311) | Introduction to Computer Systems (18-213) | Electronic Devices and Analog Circuits (18-220) | Signals and Systems (18-290) | Computational Photography (15-463) | Mathematical Foundations of Electrical Engineering (18-202) | Principles of Imperative Computation (15-122) | Calculus in Three Dimensions (21-259) | Fundamentals of Mechanical Engineering (24-101)
- Proficient with C, SystemVerilog, Python, SolidWorks, MATLAB, and Linux/UNIX
- Familiarity with HTML, CSS, LaTeX, AVR/Arduino programming/circuitry