

RAPHAEL CHERNEY

engineering design

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EDUCATION



Swiss Federal Institute of Technology
Lausanne, Switzerland

Feb 2013

- Master of Science in Microengineering with a concentration in Robotics and Autonomous Systems (GPA: 5.44/6.0)
- *Master project:* "Autonomous Micro-Aerial Vehicle Navigation Using a Custom Optic Flow Sensor Ring"
- *Selected coursework:* Applied Machine Learning, Distributed Intelligent Systems, Models of Biological Sensory-Motor Systems, Computer-Aided Engineering, Image Processing, Computer Vision, Robotics, Mobile Robots



Franklin W. Olin
College of Engineering

Needham, Massachusetts

May 2011

- Bachelor of Science in Electrical and Computer Engineering (GPA: 3.78/4.0)
- Received four-year full-tuition merit scholarship
- *Selected coursework:* Modeling and Control of Distributed Systems, Materials Science, Failure Analysis and Prevention, Mechanical Prototyping, Design Nature, Discrete Mathematics, Signals and Systems, Analog and Digital Communication, Computer Architecture, Microelectronic Circuits, Mixed Analog and Digital VLSI, Robotics, Software Design, User-Oriented Collaborative Design, Sculpture I & II

EXPERIENCE

SYNAPSE

Synapse Product Development
Seattle, Washington

Jul 2012 – Sept 2012

- Helped prototype, design, test, repair, document, and deliver embedded systems for client projects



Harvard Self-Organizing Systems Research Group
Cambridge, Massachusetts

Jun 2011 – Aug 2011

- Designed, built, programmed, and tested an autonomous robotics platform for research and education that drives on magnetic surfaces and erases whiteboards



Apple Inc.
Needham, Massachusetts

Jan 2010 – Dec 2010

- Collaborated with the iPhone Product Design team to develop a novel testing system as part of the Olin Senior Capstone Program in Engineering (SCOPE)

Microsoft

Microsoft Corporation
Redmond, Washington

Jun 2010 – Aug 2010

- Worked as a program manager to design an interactive portal for partner organizations building ERP solutions using Microsoft Dynamics Online services; researched users, refined design with team, and wrote specifications



National Aeronautics and Space Administration / Olin College Research Group
Needham, Massachusetts

Jun 2009 – Dec 2009

- Worked in small, independent engineering teams to develop electronics for experiments at the NASA Goddard Space Flight Center; designed and built both a USB multichannel analyzer and a laser alignment system



European Organization for Nuclear Research
Geneva, Switzerland

Jun 2008 – Aug 2008

- Integrated front-end electronics for data acquisition and detector control systems of the photon spectrometer and electromagnetic calorimeter of A Large Ion Collider Experiment (ALICE)

SPINOMIX Lausanne, Switzerland

Jul 2007 – Aug 2007

- Researched partner candidates and investor possibilities for a medical technology startup

LEADERSHIP & ACTIVITIES

Council of Olin Representatives (CORE) – Elected Representative for the Class of 2011 (2008-2009)

- Discussed such topics as capital investments and changes in college admissions policies

Course Assistant – Helped students understand concepts, maintained laboratory equipment, and held weekly office hours

- ENGR1200: Design Nature (Fall 2008), SCI1410: Materials Science and Solid State Chemistry (Spring 2009), SCI1121: Electricity and Magnetism (Spring 2009), and ENGR2210: Principles of Engineering (Fall 2010)

Creative activities – Painting, ceramics, freehand drawing, singing, guitar

SKILLS

Computer – Microsoft Office, LaTeX, HTML, CSS, Photoshop, DipTrace, EAGLE, Cadence (custom IC design), LTSpice, SolidWorks (3D CAD modeling), Inventor, COMSOL, MATLAB, Simulink, LabVIEW, Verilog, C, C++, Python

Machine Shop – Lathe, mill, horizontal and vertical band saws, rapid prototyping machines, laser cutter / engraver, drill press, sander, taps and various hand tools

Laboratory Equipment – Scanning Electron Microscope, Fourier transform infrared spectrometer, optical microscopes, Instron Universal Mechanical Testing System, oscilloscope, miscellaneous materials and electronics test equipment

Languages – English, French (fluent), Spanish (elementary)

NOTABLE PROJECTS



Optic Flow Control of Micro-Aerial Vehicle

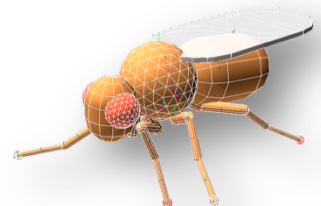
Sept 2012 – Jan 2013

- Integrated hardware for testing, including circuit debugging and embedded programming
- Developed a 3D simulator with custom physics to test sensor configurations and control strategies

3D Computational Fly

Feb 2012 – Jun 2012

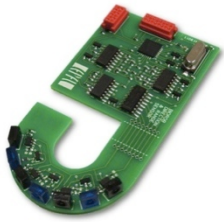
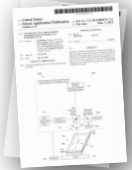
- Created a biologically-modeled, 3D simulated fly and optimized control parameters associated with locomotion to investigate biological and robotics research questions



Residual Stress in Chemically Tempered Glass

Jan 2010 – Dec 2010 (Patent Mar 2012)

- Explored several novel methods for measuring residual stress in chemically tempered glass
- *US Patent 2012/0050747* – Eli Sheldon, Edward Byun, Michael Lintz, Jayesh Gorasia, Raphael Cherney. “Non-Destructive Stress Profile Determination in Chemically Tempered Glass.”



Relative Positioning System for Mobile Robots

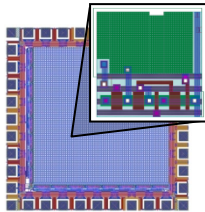
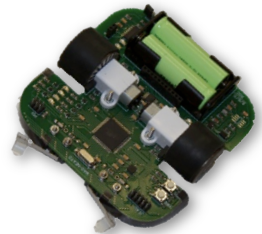
Oct 2011– Jan 2012

- Designed, built, and tested a sensor that gives the range and bearing to a modulated light source, including circuit design, component selection, simulation, PCB layout, and embedded programming

Autonomous Board Cleaning Robot

Jun 2011– Aug 2011

- Designed, built, and tested an autonomous board cleaning robot, including mechanical design, circuit design, component selection, PCB layout, and embedded programming



High Dynamic Range Imaging Sensor

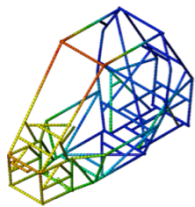
Nov 2010 – Dec 2010

- Designed, simulated, and created the layout for a high dynamic range CMOS active pixel sensor with an adjustable logarithmic response; part was fabricated and functions as expected

Intelligent Ground Vehicle Competition

Feb 2009 – Jun 2010

- In the course of a single semester, designed, built, and competed a fully autonomous off-road vehicle that followed lanes, avoided obstacles, and travelled to GPS waypoints; refined design for 2010 competition
- Placed second out of first year teams in 2009 and placed third out of 50 international teams in the 2010 design competition (\$1000 prize)



Baja SAE Automotive Design

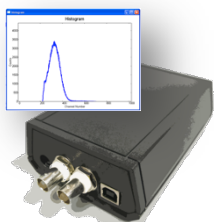
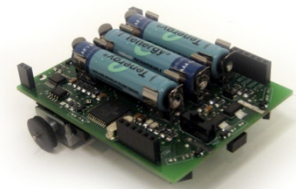
Oct 2007 – Dec 2009

- Designed, manufactured, and competed several off-road vehicles as part of the Olin Phoenix Racing team; helped design and test several chassis iterations using CAD and finite element analysis

Low-Cost Swarm Robotics Platform

Sept 2009 – Dec 2009

- Designed and fabricated a low-cost, expandable robotics platform for use in research and education, including circuit design, component selection, PCB layout, and system integration
- Among the least expensive programmable mobile robots available (component cost under \$20)



USB Multi-Channel Analyzer

Jun 2009 – Dec 2009

- Designed, built, and tested a low-cost USB multichannel analyzer for use in NASA x-ray spectrometry experiments, including high speed circuit design, component selection, PCB layout, and firmware programming
- Typical MCAs cost several thousand dollars; our design cost under \$40 in components and provided the same functionality