



Optoelectronics



International
Development



Theatre Arts

Engineering + Arts Portfolio

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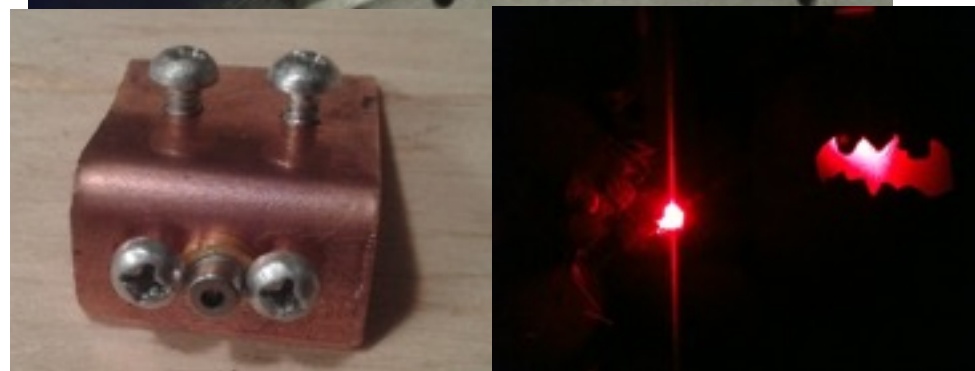
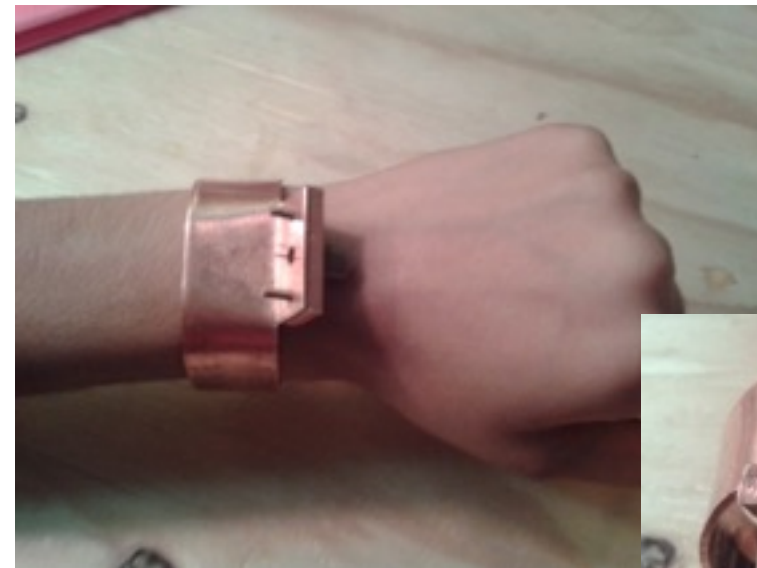
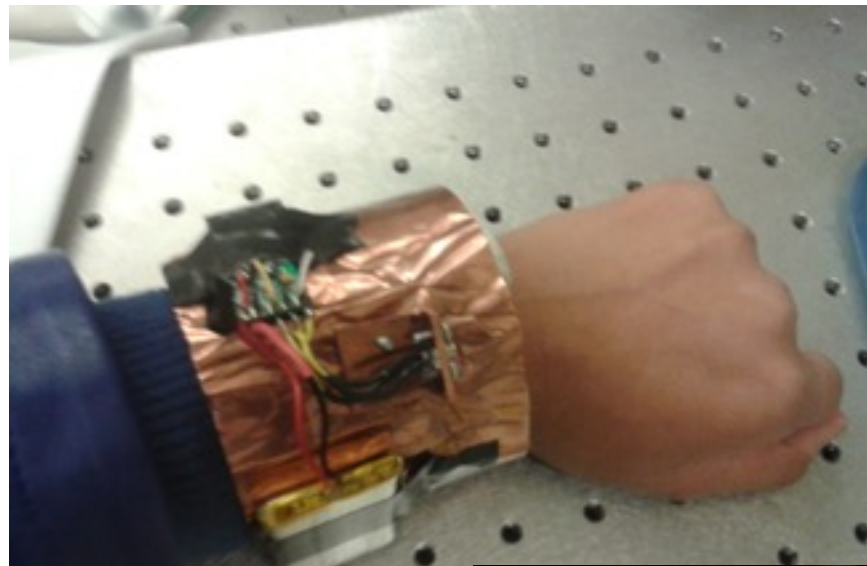
Wearable high power laser for Raman biosensing

Independent research project in EECS (Sep 2014 to Present)
How to design a wavelength stable diode laser that is wearable



Concepts/Skills:

- lasers, spectroscopy
- heat transfer
- basic electronics
- mechanical design (some done in SolidWorks), component selection, fabrication (machining, soldering)



1st & 2nd heat sink prototype
for laser above

Photoplethysmography Sensor (PPG)

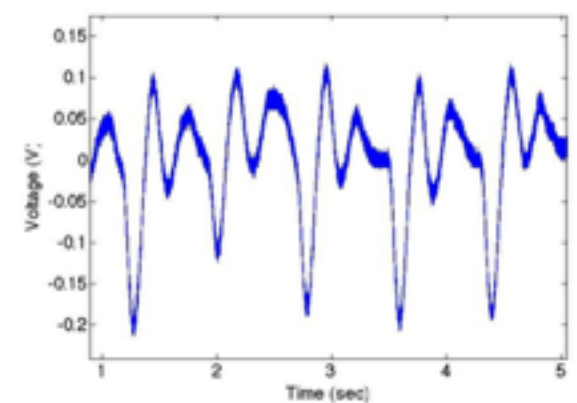
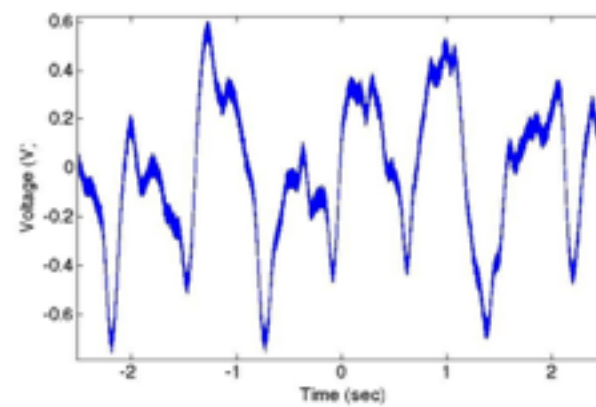
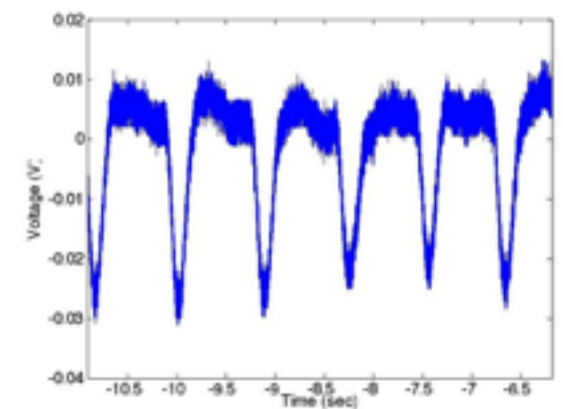
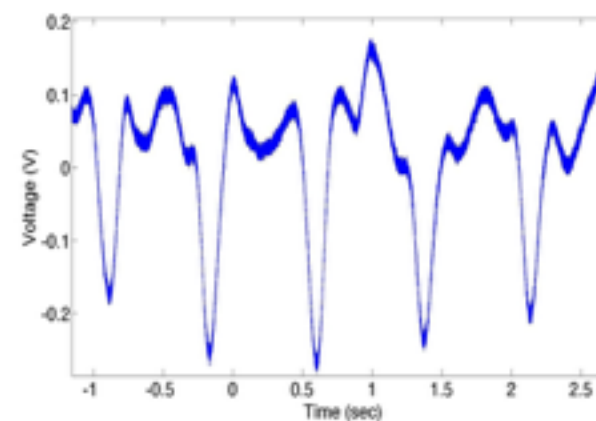
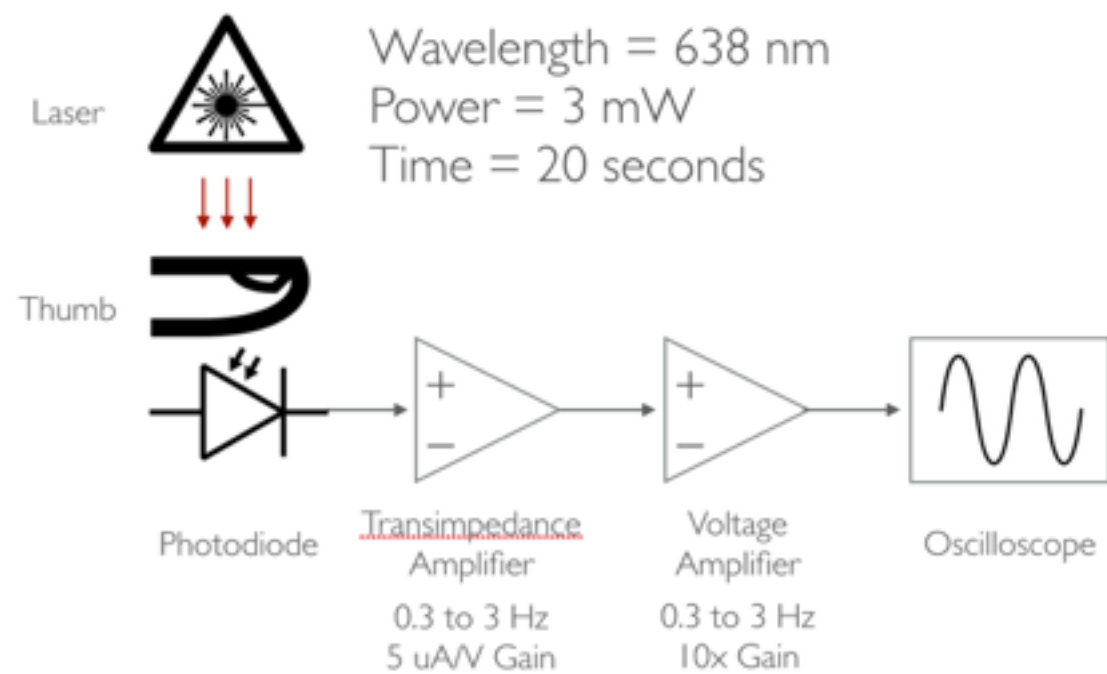
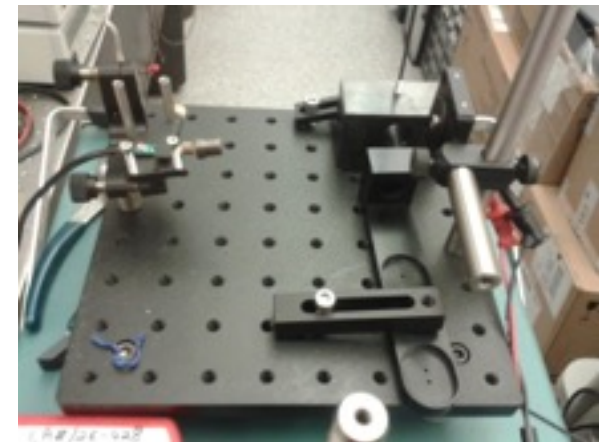
Modern Optics Lab class Final Project 2014

PPG: optical measurement of blood volume (can correlate to pulse)



Concepts/Skills:

- independent project selection
- experimental design, setup, measurements, testing
- signal processing (Matlab)



Experimental Setup

Fiber Optics Telemetry for Wireline/Perforating



Summer 2014 Internship at Halliburton R&D

First round of experiments on new project to use fiber optics for downhole sensing

Concepts/Skills:

- assembling fiber optics systems
- optoelectronic testing at high temperature
- Matlab data processing (Fourier transforms, filters, SNR)
- presenting to VP of Halliburton
- working with 6+ other engineers/scientists

Project images/details are confidential

HALLIBURTON

PeaceCorps Application Portal



International Development Hackathon 2014 project - 1st place

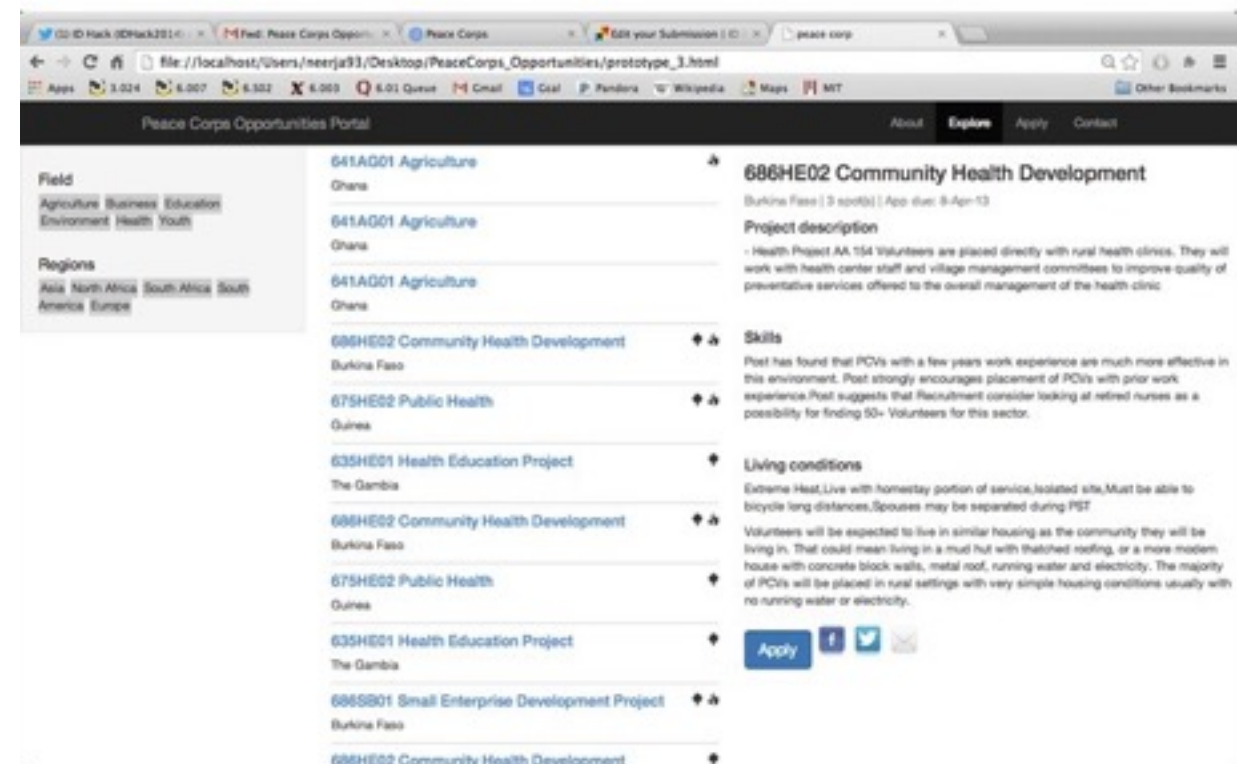
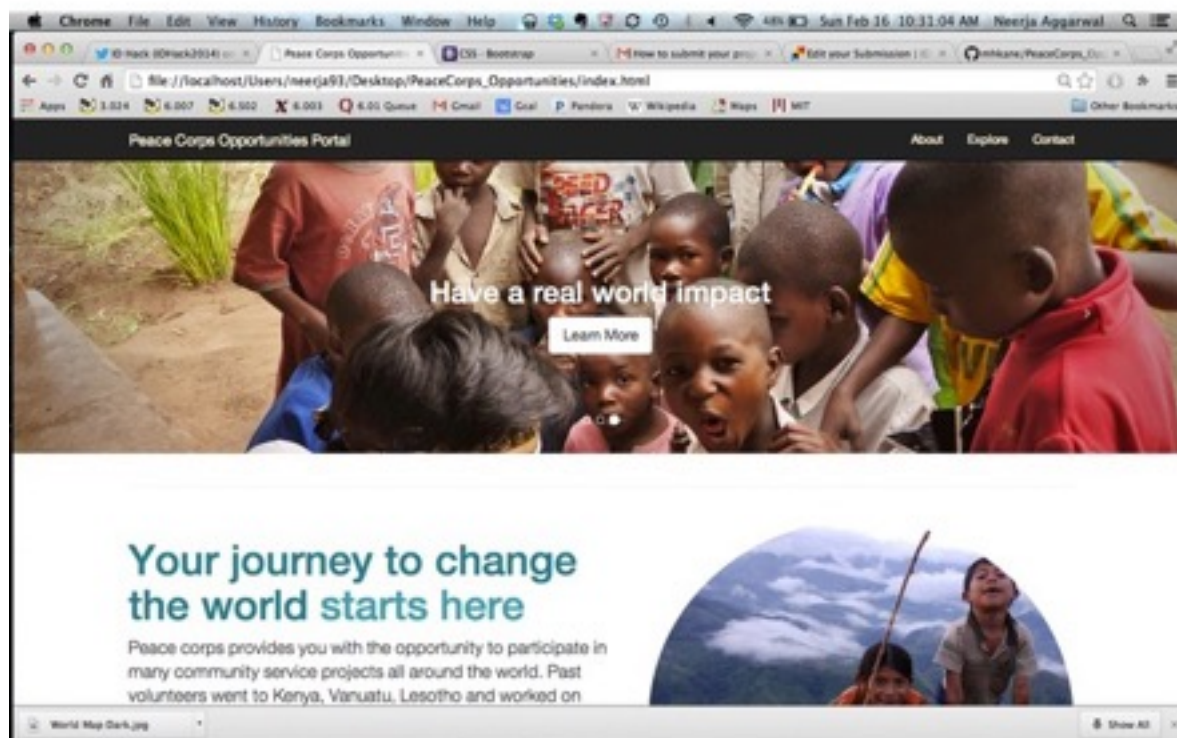
Designed an interface to apply to specific opportunities for Peace Corps - now becoming actual feature used by PeaceCorps

Concepts/Skills:

- first experience with CSS, HTML, JavaScript
- used the iterative design cycle to achieve a functional product in 12 hours
- had very little subject matter knowledge but still led a team of 6 developers who were not acquainted previously

<http://challengepost.com/software/peace-corps-opportunity-search-portal>

<https://github.com/PeaceCorps/Opportunity-Portal>



Solar Disinfection in a Box



D-Lab Design Class Project Spring 2014

Construct a water treatment system out of packaging materials for a family in Uganda refugee camps

Concepts/Skills:

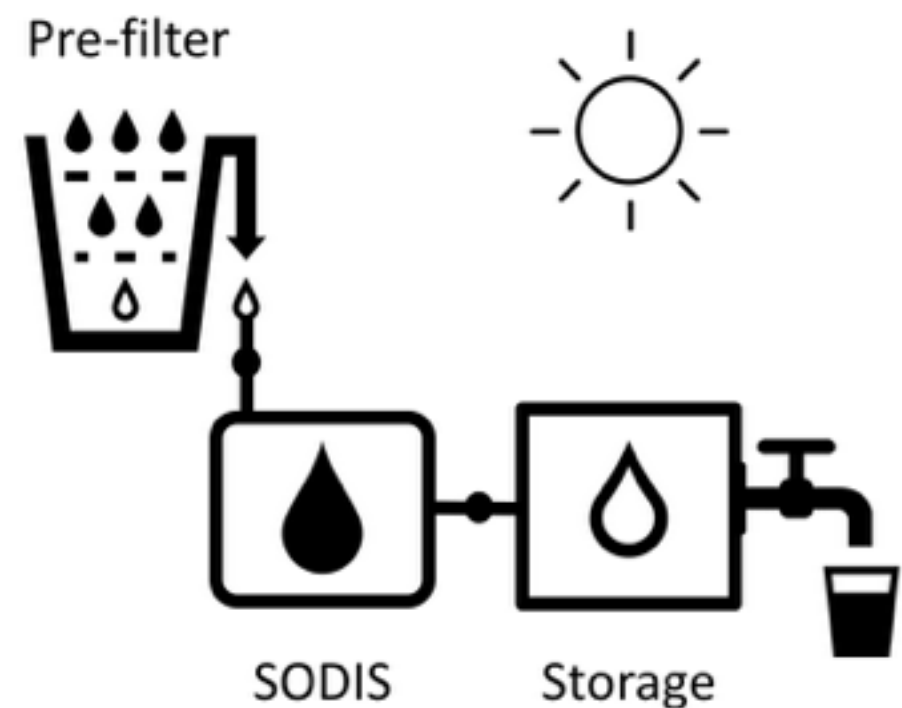
- working with team of four to complete
- information gathering to design for community across the world
- my specific design focused on storage bladder:
heat-sealing plastic + Franzia nozzle



Final assembly



Storage Bladder



Director - The Importance of Being Earnest



DramaShop Fall One Acts Nov 2014

Staged modern adaptation of Oscar Wilde's classic

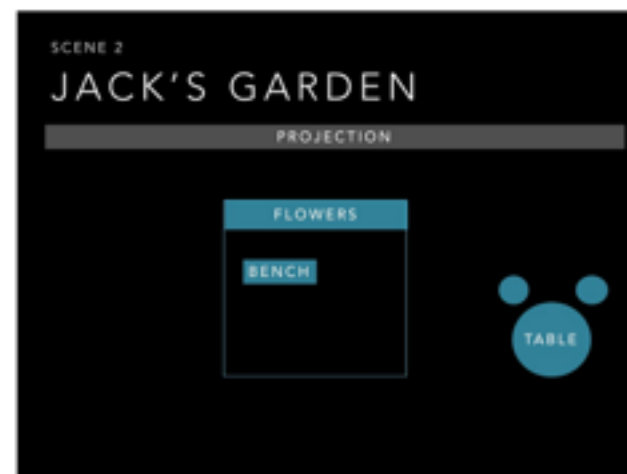
Concepts/Skills:

- final decision making on all performance and technical components
- led the vision for the production
- collaborated with a 12+ team of actors and designers
- work seen by over 250 people in audience





Costume Ideation



Set Ideation



Rehearsal Process

Director/Performer - Colours of Madness



Motion Theatre Final Project

Explored nonlinear narratives and use of *Viewpoints*

Concepts/Skills

- ideation to reality (wrote, rehearsed, performed entire work)
- finding solutions to artistic design challenges (ex plastic sheeting)
- speaking, presentation, performance skills

Final work can be viewed here:

<https://www.youtube.com/watch?v=-kuD6aWUnz0>

