Address

12701 Kanes Road
Glen Arm, MD 21057

Tel & Skype

(607) 269-7011
emma.k.france

Mail

ekf25@cornell.edu

Web

linkedin.com/
in/emmakfrance

EmmaFrance
Biomedical Instrumentation Engineer

Design Experience

2015 - 2016 **Device for Assessment of Cervical Tissue** Biohaptix, Inc.
Design, drafting, and prototyping of a minimally invasive device that can characterize mechanical stiffness and electrical impedance in tissue to diagnose disease.

→ **Led 5-person team** *of electrical and biomedical engineers*
→ **Ideation, development, and testing** *of a novel vacuum generation system*
→ **Design and drafting** *of parts in Solidworks according to ergonomic principles*
→ **Integration** *of new National Instruments data acquisition systems*
→ **Integration and tuning** *of new electromechanical PID controls with LabView*
→ **Component-level verification** *of electronics using standard test tool equipment*
→ **System level integration testing** *of various new components*
→ **Overhaul of design history** *records to improve version control and organization* → **Circuit schematic development**, *block diagram creation, and other documentation and user guideline updates*

New prototype improved on previous iteration in portability, cost, and reliability.

Work & Research Experience

11/15 - Now **Simulation of Exercise Under Artificial Gravity** Diaz Lab, Cornell University
Tested and debugged software during integration with latest MathWorks release, used in-depth understanding of physiology to update code base for ease-of-use.

06/15 - 08/15 **High-Throughput Gut Microbiome Analysis** Ley Lab, Cornell University
Completed preparation of over 1000 human stool samples for processing following biosafety level 2 guidelines, extracted genomic DNA from these samples using a robotic system, and assimilated new samples into the established system.

09/14 - 05/15 **Wellness Ambassador** Rite Aid Pharmacy
Mediated relationship between patients and pharmacy to encourage greater use of pharmacy's clinical resources, assisted in over 1000 vaccinations for seasonal influenza during traveling flu shot clinics, and conducted monthly educational Wellness events targeting various health concerns of seniors.

07/14 - 09/14 **Morning Course Instructor** Cornell Adult University Summer Program
Created a week-long science course for groups of teens ages 13-15 guided assistant teachers in developing their own demos and lecture segments, generated passion for ornithology, space exploration, and basic chemistry through organized field trips, and engaged students in exploring advanced science topics through activity-based lectures.

06/13 - 08/13 **Computational Epidemiology** Independent, Cornell University
Designed and implemented behavioral surveys on flu-avoidance behaviors, developed a small-world network model of influenza spread in the workplace, and evaluated the model's output leading to the discovery of a distinct epidemic threshold.

06/12 - 08/12 **Computational Modeling of Retinal Signals** Brainard Lab, University of Pennsylvania
Developed a package of Matlab scripts designed to simulate retinal output based on image matrix input and integrated package with VSET software to produce a complete simulator of retinal image perception.

Coursework and Projects

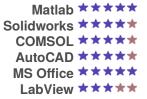## Education

Cornell University
Ithaca, NY

Masters of Engineering
GPA 3.99 | May 2016

Bachelor of Arts,
Psychology/Pre-med
GPA 3.72 | May 2014

Awards

Hunter Rawlings
Cornell Presidential
Research Scholarship
2012-2014

Software

Matlab ★★★★★
Solidworks ★★★★★
COMSOL ★★★★★
AutoCAD ★★★★★
MS Office ★★★★★
LabView ★★★★★

Hardware

Prototyping Basics
Perfboarding,
breadboarding, test
equipment
★★★★★

NI MyRio
★★★★★

Digilent Pmod Series
★★★★★

Fluid systems
Portable pumps,
medical tubing, fluid
actuators
★★★★★

Microchip PIC18
★★★★★

Relevant Coursework Intro to Spaceflight Mechanics, Bioprocess Engineering, Biomedical Engineering Analysis of Metabolic and Structural Systems, Bioengineering Thermodynamics and Kinetics, Electrical and Chemical Physiology, Introduction to Computing using Matlab, Biomedical Transport Phenomena, Electronics for Biomedical Engineers, Intro to CADD, Biomedical Materials and Their Applications, Intro to Number Theory, Computer Aided Engineering

Spring 2016   **Finite Element Analysis of Thermal Transfer During Astronaut EVA**
Modeled effects of perspiration on functionality of Liquid Cooling and Ventilation Garment (LCVG) for Astronaut Extravehicular Activity using COMSOL software.

Spring 2016   **Sensor System and Data Acquisition for Rudimentary Pulse Oximeter**
Built analog circuitry and designed analog filters for oscillating LED sensor system, followed procedure for incorporating PIC18 microcontroller-based data acquisition and data interpretation.

Outreach & Activities

09/12 - 05/14   **Tutor**   Cornell Mathematics Outreach Program
Led small-group activities and coordinated with teachers to provide individual attention to students in need at local high school and middle school.

05/13-05/14   **Vaccine Education Initiative**   President, Founder
Instituted a human-factors based poster campaign to prevent seasonal influenza, managed process of registration and funding approval, and initialized communication channels with professionals at the local Health Department.