Roland Allen Sanford

LinkedIn: www.linkedin.com/in/rasanford
GitHub: www.github.com/ras9841
2930 Gaines Basin Rd, Albion, NY 14411
585.590.7489 | ras9841@rit.edu

Overview

A computational scientist with a background in physics, math, and computer science interested in the construction and analysis of mathematical models of physical systems.

Educational Highlights

Rochester Institute of Technology (RIT) Rochester, NY

Master of Science	Computational Mathematics	Expected May 2018
Bachelor of Science	Computational Mathematics	Expected May 2018
Bachelor of Science	Physics	Expected May 2018

Computer Courses	Parallel and Distributed Systems, Mechanics of Programming, Software Engineering
Math Courses	Advanced Linear Algebra, Numerical Analysis, Stochastic Processes, Real Analysis
Physics Courses	Classical Mechanics, Electricity and Magnetism, Advanced Laboratory in Physics

Relevant Experience

Computational Imaging of Atrial Fibrillation Feb. 2015—Present

- Developed the code and documentation for a MATLAB pipeline that reconstructs the epicardial potentials of a patient's heart by implementing second-order Tikhonov regularization to solve an ill-posed inverse problem.
- Pipeline includes constructing patient-specific geometric models of the torso and the atria as well as processing electrocardiogram data.
- Delivered phase mapping videos and images resulting from dominant frequency analysis to physician-scientists at Johns Hopkins University to validate our modeling process.

Mathematical Modeling of Contact Lenses Jan. 2015—Present

- Modeled the progression of a soft contact lens and a cylindrically-symmetric eye towards equilibrium.
- Derived the governing PDEs by balancing the stresses in the eye and on its boundaries.
- Discretized the PDEs using forth-order finite difference equations, and solved the resulting coupled system by implementing successive over-relaxation and forward Euler numerical techniques in C++.

Characterization of Heusler Alloys Jan. 2014—Dec. 2014

- Researched the Heusler Alloy $Ni_2Mn(Ga_{1-x}Zn_x)$ to determine the effect of Zinc concentration on the alloy's coercivity and Curie temperature.
- Prepared, mounted, and conducted experiments on samples using a Vibrating Sample Magnetometer and an AC Susceptibility rig.
- Wrote MATLAB and python code to aid data acquisition and experimental analysis.

Additional Projects

Chebfun Statistics Ongoing

Worked with faculty at the University of Delaware to add a random variable class and associated methods to the Chebfun MATLAB package (www.chebfun.org).

Contact Lens Web Application Completed

Designed an interactive contact lens application for Alden Optical that displays user-made changes in the lens design in real time (pending release).

Skills

Languages:	Python, C, Java, MATLAB, LaTeX; familiar with C++, JavaScript, Julia, and Android
Operating Systems:	Windows and Linux (Arch, Fedora, Debian, and Ubuntu); familiar with Mac OS