

CRAIG FINCH
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INDUSTRY EXPERIENCE

TriQuint Semiconductor
Design Engineer

Orlando, FL
1997-2004

- Designed radio frequency (RF) signal processing devices using surface acoustic wave (SAW) technology
- Earned the position of Technical Leader within the handset design group
- Proposed and negotiated technical specifications with customers
- Improved relationships with domestic and foreign customers through site visits, technical support, and application engineering
- Enhanced manufacturing yield for high-volume products (shipping over 15 million units) using six-sigma concepts and statistical process control techniques

RESEARCH EXPERIENCE

Measurement and Simulation of Protein Adsorption

- Built a custom biosensor incorporating a Whispering Gallery Mode (WGM) optical resonator in a microfluidic flow cell
- Measured the adsorption of several proteins on functionalized silica surfaces
- Used computational fluid dynamics (CFD) to predict the transport of protein in the microfluidic system
- Developed a Brownian dynamics simulation of protein adsorption that includes DLVO forces and shear flow
- Created a continuum boundary condition to incorporate hard-sphere adsorption results from Brownian dynamics into CFD transport simulations

Functional *in vitro* Model of the Human Alveolus

Army

- Developed a CFD model of the transport of oxygen and carbon dioxide in a microfluidic bioreactor that mimics the function of a human alveolus
- Developed a custom boundary condition to predict gas transport through an engineered alveolar tissue construct that models the alveolar membrane
- Used CFD simulations to design microfluidic structures to minimize the distribution of residence times in the bioreactor

Whole-Cell Simulation of a Model Neuronal Cell

National Institutes of Health

- Improved upon an existing Hodgkin-Huxley model to predict action potentials in NG108-15 neuroblastoma cells
- Developed an algorithm to find the best match for an experimental action potential in a database of simulated action potentials

Development of a Sensor to Detect Pathogenic Bacteria

Air Force Research Lab

- Simulated the adsorption of bacteria to a functionalized quartz crystal microbalance (QCM) sensor

SKILLS

- Programming languages: Python, C++, Fortran, MATLAB
- Programming tools: NumPy, SciPy, Sage, CGAL, LAPACK, ODEPACK, wxWidgets, high-performance parallel computing with MPI, VTK, matplotlib, Subversion, Git, LaTeX
- Simulation techniques: finite volume, finite element, and stochastic (Monte Carlo) methods
- Test and measurement: oscilloscopes, function generators, DAQ cards, spectrum analyzers, network analyzers, etc.

EDUCATION

Ph.D Candidate in Modeling and Simulation

August 2011 (anticipated)

University of Central Florida, Orlando, FL

Emphasis: Quantitative Aspects of Simulation

GPA: 3.83 out of 4.0

Proposed Dissertation: *Multiscale Simulation of Protein Adsorption in Microfluidic Channels*

Master of Science in Electrical Engineering

August 2001

University of Central Florida, Orlando, FL

Thesis: *Electrical Characterization of SAW Filter Packaging*

Bachelor of Science in Electrical Engineering

May 1997

University of Illinois at Urbana-Champaign