Brian Ruttenberg

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Education

2008–present **PhD (Expected June, 2012)**, *University of California*, Santa Barbara, CA.
PhD in Computer Science, GPA: 3.9/4.0

- Dissertation: *Mining and Modeling of Biological Images* (Expected), Ambuj K. Singh, Advisor
- Significant Courses: Bioinformatics, Computer Imaging, Experimental Cytology and Digital Imaging, Multimedia Index Structures, Parallel and Distributed Systems, Combinatorial Algorithms, Computer Architecture, Web Mining

2006–2008 **MS**, *University of California*, Santa Barbara, CA.
Masters in Computer Science

1996–2000 **BSE**, *University of Michigan*, Ann Arbor, MI.
Bachelors of Science in Computer Engineering, GPA: 3.52/4.0, *magna cum laude*

Experience

Research

2007–present **Graduate Student Researcher**, *Center for Bio–Image Informatics*, Santa Barbara, CA.
Knowledge discovery in biological and image data using novel data mining and statistical methods.

- Designed a novel graph clustering technique (based on modularity optimization) for spatially embedded networks and applied to a cellular network in tissue (In progress).
- Modeled biological tissue in probabilistic graph models (Markov Random Fields) to simulate and infer the physical properties and spatial organization of cell populations in healthy and pathological tissue.
- Developed effective feature extraction algorithms for large images and designed a geodesic feature space based on biological networks in order mine and quantify statistically significant spatial changes in the retina after injury.
- Improved Earth Mover's Distance based mining and querying of multi–dimensional probabilistic data by developing novel vector projections, parametric approximations and indexing methods.
- Designed novel protein sequence alignment algorithms based on gene duplication to test hypotheses of retinal protein origins.

2007–2007 **Intern**, *National Institutes of Health*, Bethesda, MD.
Developed proteomics tools at National Heart, Lung and Blood Institute

- Researched PhosphoScore, a new and novel algorithm to detect and score phosphorylation sites in mass spectrometry data.
- Developed open source PhosphoScore tool and GUI in Java, enabling researchers to easily use and modify the new method (currently in use by several research labs).

Professional

2004–2006 **Senior Engineer**, *Qualcomm, Inc*, San Diego, CA.
Mobile 3–D graphics hardware group

- Responsible for the entire architecture of the 3D front end in graphics shader core.
- Designed and implemented rasterization, triangle setup and blending for mobile chipsets.

2000–2004 **Senior Component Design Engineer**, *Intel Corp*, Folsom, CA.
Integrated 3–D graphics hardware group

- Architected and implemented memory and caching systems for three different graphics cores used in eight of Intel's chipsets.
- Successfully designed a new feature on Intel's 3D graphics core that resulted in 10–15% speedup on 3D applications.

Teaching

2008–2008 **Graduate Teaching Assistant**, *University of California*, Santa Barbara, CA.
Introduction to C, C++ and Unix

Patents

G. Jiao, B. Ruttenberg, C. Yu, and Y. Du, "Graphics Processing Unit With Shared Arithmetic Logic Unit," U.S. Patent #8,009,172, 2011.

——, "Graphics Processing Unit With Extended Vertex Cache," U.S. Patent #7,952,588, 2011.

G. Jiao, W. Torzewski, C. Yu, and B. Ruttenberg, "Universal Rasterization of graphic primitives," U.S. Patent #7,791,605, 2010.

B. Ruttenberg and P. Surti, "Efficient Use of a Render Cache," U.S. Patent #7,760,804, 2010.

P. Surti, B. Ruttenberg, and A. Navale, "Banking Render Cache for Multiple Access," U.S. Patent #7,320,053, 2008.

Technical Skills

Languages	C/C++, Java, Perl, Bash, LaTeX	Packages	OpenCV, Boost, MPI
Platforms	Linux, Windows	Scientific	Matlab

Awards

2009–2010 **Dean's Fellowship**, *University of California*, Santa Barbara, CA.

Publications

Full list available at personal website