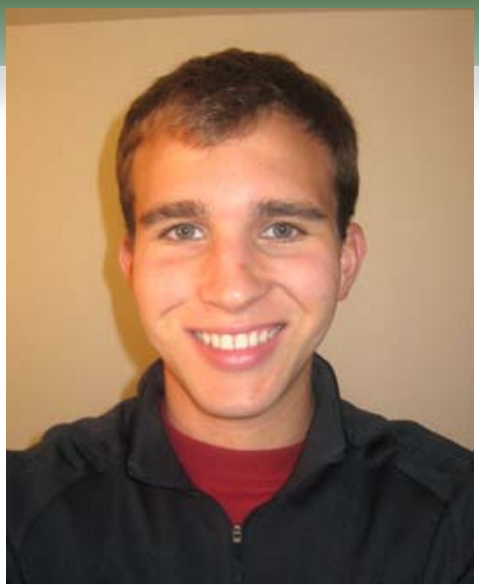
Ben Rolfs



Graduate Institution: Stanford University

Location: Stanford, CA

Graduate Discipline: Computational/Applied Mathematics

Hometown: Winchester, MA

Research Interests:

In the broadest sense, I am interested in the boundary between mathematics and natural science – for instance, developing algorithms or models with a focus on applications to other fields. Mathematical models have proven invaluable to understanding physical systems, and of course it is crucial to be able to efficiently implement these models on a computer.

Specifically, I have been interested in the simulation of rare events in high-dimensional stochastic systems. Many complicated natural phenomena (eg. weather patterns, or protein interactions) incorporate large variation in scale. A protein may take a long time to fold, but the folding event itself is very quick. In this case, simulation becomes difficult, and how best to deal with these issues is one of my interests.

I have also become interested in graphical models for representing data, for instance methods for estimating the covariance matrices of Gaussian models with a focus on dimension reduction. As an example, one might have gene expression information corresponding to a large number of proteins, and would like to figure out which genes are the most important 'hubs'. Performing such analyses in a statistically sound manner is increasingly important as the size and dimensionality of data sets has exploded.

About me:

I am a first-year student at Stanford University studying in the Institute for Computational and Applied Mathematics. I graduated from Northwestern University in 2009, majoring in mathematics, physics, and integrated science.

At Stanford, I am involved in the local branch of SIAM and am also interested in furthering mathematics and science education in public schools around Stanford. My personal hobbies and interests include camping, rock climbing, running, lacrosse, jazz trumpet, and all types of music.