My Research Interests

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31 May 2013
About Me

How I got into Mathematics

- Curiosity
- I’ve always asked a lot of questions
- Sometimes the answers are unknown

What I aim to do as a Mathematician

- Computational techniques to give insight into mathematical problems
- Examples include:
  - Collective rhythm of firefly flashes
  - Formation of magnetism from interactions on the scale of atoms
  - Networks of neurons, the building blocks of the nervous system
The nervous system is composed of cells called neurons.
They are connected in complex networks.
They use electrical impulses to communicate.
The electrical impulses from other neurons can cause a neuron to fire.

Can simulate on a computer how a network responds to an input signal.

Some networks will respond differently every time, even when the signal is the same!
Networks of Neurons

The input signal may be sensory input or another group of neurons.

Networks of neurons close to the sensory input usually respond consistently.

Networks of neurons further away from the sensory input may respond inconsistently.
Chaos

- Chaos: Small changes grow over time
Varying network response is a result of chaos!

My goal:
- Biological: Understand characteristics of chaotic networks of neurons
- Mathematical: Develop tools and theory in a more general setting
Thank you!