

ECE 796:
Models of the Neuron

Organizational Meeting #2
Friday, March 30, 2007

Discussion topics for Lecture #10

Forms of neural computation:

1. Addition - Zhenkun
2. Subtraction - Charles
3. Multiplication - Yuan
4. Division - Benedict
5. Coincidence detection - Stephen
6. Hebbian learning - Mohamed
7. Spike-timing-dependent plasticity
8. Homeostatic plasticity (synaptic scaling)

Lecture #10 topics (cont.)

For each of these, discuss (as appropriate):

- Basic principles
- Synaptic specializations
- Dendritic-tree specializations
- Somatic specializations
- Ion channel specializations

Feel free to give some simulation results if you like!

Project topic suggestions

- Model of a particular cell type
- Model of a small neural circuit
- Stochastic process inputs into integrate-and-fire model
- Compartmental model of an axon
- Comparison of stochastic ion channel gating algorithms
- Model incorporating synaptic plasticity