Both brains and computers compute, but in very different ways. This seminar will discuss the software and hardware of brains and computers as well as the interactions between them, past, present, and future. We will discuss the fascinating intellectual history connecting the two and suggest why these two computing devices have such trouble dealing with each other.

The seminar will provide an introduction to the way brains are organized, the way computers are organized, and why they are good at different things. We will also talk a little about our current research, specifically the Ersatz Brain Project, our attempt to design hardware and software for "a first-class second-class brain." At a minimum, this seminar will provide some exposure to important ideas in neuroscience, cognitive science, and perhaps computer science.

The instructor of this course is James Anderson, James_Anderson@brown.edu. I can be reached on the telephone (Anderson X32195 as well as physically, (Anderson Metcalf 221). Course conference hours are Tuesday and Thursday from 11 to Noon. I will often be available at times other than conference hours but if I am busy I will say so.

Possible Course Topics

1. How silicon computers work, a little bit.
2. Historical anecdotes and philosophical digressions.
4. Formal models for the neuron. McCulloch-Pitts, connectionist.
5. Limulus: a simple invertebrate visual system.
7. Association, psychology, Western culture, Hebb synapses.
10. Cerebral cortex and cortical data representations.

Text: An Introduction to Neural Networks, James A. Anderson, MIT Press.

Requirements: Several problem sets will be assigned during the term. Students will be asked to write a term paper on a topic of their choice.