

CS 152 Fall 2006
Term Project Information

It's time to start thinking about the term project, on which a significant portion of the course grade will be based.

A firm proposal on your topic is due by Wed. October 25. You should discuss your idea for the proposed topic with me before then, to make sure that it is acceptable, and possibly to get some additional pointers. The proposal itself should be 1-2 paragraphs, ideally with references that you have already checked.

Your project results will need to be displayed on a web page, from which all supporting material must be accessible (except for copies of copyrighted material). You should establish it by the time of the first presentation. Here is some additional information.

1. The term project can be done by individuals or in teams of two. For a team of two, the ambition level should be higher, because the expectation level will be.
2. The project does not demand original research (it would be nice, but the timeframe is short); however, there should be some kind of contribution by the student, not merely a rehash of existing literature or code. Contributions can take one of the following forms:
 - a. An implementation of an application of particular neural network or related approach to a problem or class of problems. This should be an additional challenge over what you have already done. For example, a simple extension of your backpropagator will not be enough.
 - b. A demonstration (e.g. an applet) of an approach for tutorial purposes. The demo should not be a mere replicate of an existing demo.
 - c. A critique or competitive analysis of two or more approaches to a problem, based on results reported on in the literature and/or computation.
 - d. A thorough survey of diverse approaches to a given problem. A survey might differ from a critique in that it doesn't attempt to make value judgments. Consequently, it is assumed that for a given time expenditure, a survey could be a lot broader.
3. Possible project areas:
 - a. In class, we present numerous network models. I did not go into the same depth for each of model, nor can I do them all justice. Here is a chance to delve deeper into one or more of those models.

- b. There are some models I haven't discussed at all (so far), such as:
 - i. Growing Neural Gases
 - ii. Independent Component Analysis
 - iii. Hinton's Wake/Sleep networks
 - iv. Combination of neural nets with evolutionary computation and/or fuzzy logic
 - v. Hardware implementation of networks
 - vi. Knowledge extraction from networks
 - vii. Kinematic applications, such as riding a bicycle or unicycle
 - viii. Application to robotics, financial analysis, music, natural language, physics, data mining, etc.

You should begin with a literature survey to see some of what's "out there" with respect to a tentative topic. A web search is an obvious place to begin, but there is material not found on the web; you may have to use the library.

In addition to Google, you can make use of:

- CiteSeer digital research library: <http://citeseer.ist.psu.edu/>
- IEEE Explore: <http://ieeexplore.ieee.org/> (Our library pays for a subscription.)
- ACM Portal: <http://portal.acm.org/portal.cfm> (We pay for a subscription.)
- Other on-line journals (We pay for some subscriptions.)

Once your project has been established, you will need to:

- Make a class presentation on some investigation you have done, such as report on a research paper. These will start in early November.
- Make a class interim progress report.
- Make a final presentation.

in addition constructing to your web page.

Some examples of previous projects are listed at:

<http://www.cs.hmc.edu/courses/2003/fall/cs152/projects2003.html>

The web sites for some of these are still standing.

Topics I'd prefer you didn't pursue:

- Predicting the stock market (too many unquantifiable inputs required)
- Playing blackjack (card counting required, plus it's been done multiple times)
- Landing an airplane (too many inputs and outputs, no training data)
- Rock-climbing and other pursuits for which there is no clear objective

I don't want to squelch anyone's creativity, so if you have a burning desire for one of these, please see me early on for discussion.