Pitching your work
Neural networks

CSE 481b
Lecture 13
February 14, 2006
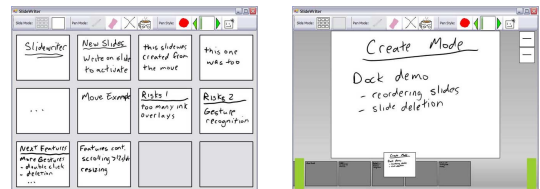

Announcements

- Thursday, Feb 16, Jay Pittman
- Tuesday, Feb 21, work day
- Thursday, Feb 23, alpha release

Presentation skills

- Very important in a technology career
  - but they receive little emphasis

Slidemaker Presentation

Goals of prototype presentations

- Show the project is on track
- Demonstrate that key technical hurdles had could be addressed
- Preview of final application

Presentations in CSE 481b

- Vision
  - Present initial ideas for feedback
  - Scope and feasibility
- First Prototype
- Alpha
  - Status and preview of final deliverable
  - Minimal viable product
  - Stretch goals

Final Presentations for CSE 481b

- Convey what you have done
- What the application does
- What is cool about it
- Tablet PC aspects of the project
- Technological innovation
- Accessible to the entire audience
- Introduce entire team

What makes a successful presentation

Challenges for final presentation

- Diverse audience
  - Assume familiarity with Tablet PC – but no familiarity with your project
- Need to quickly motivate application core scenario
- Demonstrate application and innovation
- A story line, or working through a task is often helpful for tying together features

Challenges (continued)

- Avoid time consuming operations
  - Pre-cooked data can be helpful
  - Some details (such as startup) can be skipped
- Audience participation or input can be engaging – but has risks
  - New bugs
  - New data

Challenges (continued)

- Save the riskiest stuff to the end
  - It's okay to have some things not work, after you have established success

Recommendations

- Involve the entire team in preparing for the demo
- Work from a demo script
- Practice and time presentation
- Minimize risks
- A few powerpoint slides are fine

Technology demos
Things go wrong

- Failure of Eric Lee's server demo
- Bug exposed with different screen resolution
- Network failure when in EE1 0xx instead of CSE
- Z: drive not available in Kane
- Unable to connect to the projector

Keys to successful demos

- Risk management
  - Things go wrong with new deployments
  - Environmental changes hard to test for
  - Control as many aspects as you can
    - Use your own hardware
  - Test the configuration
  - Test on site
  - Beware of last minute changes
    - Even if they can't do any damage
  - Have a backup plan

Ethics of demos

- Faking it.

Common Mistakes When Making Pitches

- Misjudging your audience (their interests, background, requirements, etc.)
  - E.g., assuming that their understanding prior to the presentation is similar to yours in level of depth
- Not addressing the "why" question to motivate your idea
- Not helping the audience understand the "big picture" of the area in which your product fits
- Not covering existing alternatives and what specific novelty you are offering
- Not ensuring that everyone can comfortably hear/see what you're presenting

This applies to making presentations in general.

Value Proposition Statement

- Your audience, after listening to your pitch, must be able to *at least* fill out the following template reasonably accurately.
- From "Crossing the Chasm" by Geoffrey Moore

For (target customer)
who (statement of need or opportunity)
the (product or company name)
is a (product or company category)
that (statement of key benefit / compelling reason to buy).
Unlike (primary "competitive" alternative),
our product (statement of primary differentiation).

Value Proposition Statement: Let Me Try It

For users of the "pine" email client software on Unix
who need to easily find content in their past email correspondence
the "pine+" product
is an email client software
that is backwards compatible with "pine" and also free.
Unlike "pine" or other similar Unix-based email clients,
our product provides an intuitive way to annotate email messages with keywords of the user's choice in order to facilitate subsequent searching by using one or more keywords in addition to the search functionality that "pine" offers.

Value Proposition Statement: Your Turn…

For (target customer)
who (statement of need or opportunity)
the (product or company name)
is a (product or company category)
that (statement of key benefit / compelling reason to buy).
Unlike (primary "competitive" alternative),
**our product** (statement of primary differentiation).

Neural Networks

- Fundamentals for Handwriting Reco Lecture (Jay Pittman)
- Recognition algorithm

- Learning based recognition algorithm

General considerations for learning algorithms

- Training sets
  - Collection
  - Evaluation
- Training cost
  - Time and space
- Algorithm cost
  - Time and space
- Robustness to error

Neural networks Perceptrons

- Motivated by considerations of the brain
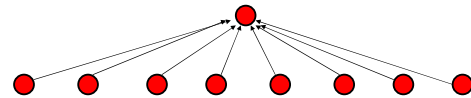
Single layer neural networks

- Bias weights
  - $x = \Sigma a_i y_i$
- Threshold activation function
  - Step function
  - Sigmoid function: $1/(1 + e^{-x})$
  - $f_A(Y) = 1/(1 + e^{-x})$ where $x = \Sigma a_i y_i$

Recognition problem

- Given a set of true instances T and false instances F set weights to maximize
  $\Sigma_{Y \text{ in } T} f_A(Y) - \Sigma_{Y \text{ in } F} f_A(Y)$
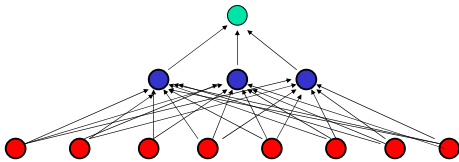
What you can do with single layer networks

- Any linearly separable dataset can be recognized with a single layer neural network

Gradient descent algorithm

- Maximize correctness function

- Choose initial weights
- While not at optimum
  - Compute derivative
  - Move along derivative

- It can be proved this converges

However, single layer networks are very limited

Multilayer networks with hidden nodes

- Can recognized much wider range of data set
- The gradient descent algorithm generalizes to this case