Evaluation of Speech Detection Algorithm

Project 1b
Due February 14th

Overview

- Experiments to evaluate performance of your Speech Detection project (proj1)
- Focus not only on how the algorithm performs, but also
  - the formulation of hypotheses
  - design, implementation and analysis of experiments to test the hypotheses
  - writeup

Measures of Performance

- User perception. Some possibilities are:
  - User opinion (rating) on quality
  - Understandability
  - Errors in listening ...
- System impact. Some possibilities are:
  - CPU load
  - Size (in bytes) of sound recorded (without silence)
  - Interrupts
  - Processing time
  - Memory use...
- Decide on how each is to be measured
  - Example: 1-10 for perception
  - Example: Time for CPU

Independent Variables

- At least two. Possibilities:
  - Speaking tests: counting, vocabulary, ...
  - Other languages: Hindi, Chinese, Pig-Latin, ...
  - Personal characteristics: Gender, Age, Shoe size ...
  - Background noise: quiet, noisy, Patriot's game, ...
  - Other systems: Win, Linux, Dell, Compaq, Amiga...
  - Hardware: cheap microphone, sound card
  - Other audio quality parameters: rate, size, ...
  - ...

Algorithm Modifications

- Possibilities include:
  - Thresholds.
  - Sound chunk size.
  - Endpoint detection length.
  - Other modifications specific to your implementation.
  - ...
- Formulate hypotheses
  - About how a change in the independent variables affects your measures of performance

Results and Analysis

- Details on results and analysis
- Results are numeric measures
  - graphs, charts or tables
- Analysis manipulates data
  - understand relationships
  - interpreting the results
- Consider if data supports or rejects the hypotheses
Report

- Introduction
  - hypotheses and motivation for them
  - (not on silence detection, in general)
- Background on your algorithm
- Design of your experiments
  - details on all of above
- Analysis
- Conclusions
  - summarize findings
- Abstract
  - 1 paragraph that abstracts whole report
  - Write last, goes first

Hints

- Gnuplot or Excel

Hand In

- Online turnin (see Web page)
  - Send group info
- Turn in:
  - Any testing Code/Scripts used/modified
  - Makefile/Project file
- Hardcopy