Topics for today

- General introduction to NLP
  - Why study NLP?
- Handouts
  - Class description and syllabus
  - Student info sheet

"natural" language
- Languages that people use to communicate with one another

Ultimate goal
- To build computer systems that perform as well at using natural language as humans do

Immediate goal
- To build computer systems that can process text and speech more intelligently

Dialogue systems

- Require both understanding and generation
  - Dave: Open the pod bay doors, HAL.
  - HAL: I'm sorry Dave, I'm afraid I can't do that.
  - Dave: What's the problem?
  - HAL: I think you know what the problem is just as well as I do.

Why study NLP?

- Useful applications...
  - E.g. information retrieval

  Topic: Advantages and disadvantages of using potassium hydroxide in any aspect of organic farming, especially...
Why study NLP?

- Useful applications…
  - E.g. question answering systems
    - How many calories are there in a Big Mac?
    - Who is the voice of Miss Piggy?
    - Who was the first American in space?
  - Retrieve not just relevant documents, but return the answer

- Useful applications…
  - E.g. summarization

"The extension of the coverage of the health services to the underserved or not served population of the countries of the region was the central goal of the Ten-Year Plan and probably that of greater scope and transcendence."

Why study NLP?

- Interdisciplinary…
  - Linguistics
    - models for language
  - Psychology and psycholinguistics
    - models of cognitive processes/language
  - Mathematics
    - studies properties of formal models, methods of inference from these models
  - vs. NLP
    - Computational study of language use
    - Definite engineering aspect in addition to a scientific one
      - Engineering: to enable effective human-machine communication
      - Scientific: to explore the nature of linguistic communication
    - Emphasis on computational, not cognitive plausibility
    - Models of language: optional

Bill Gates, 1997 "…now we’re betting the company on these natural interface technologies"
Why study NLP?

- Challenging…
  - AI-complete
    » To solve NLP, you’d need to solve all of the problems in AI
  - Turing test
    » Posits that engaging effectively in linguistic behavior is a sufficient condition for having achieved intelligence.
- …But little kids can “do” NLP…
  - Next time: Why is NLP hard?

Syllabus (tentative)

- Introduction
- History and state-of-the-art
- Morphology
- N-grams
- Context-sensitive spelling correction
- Part-of-speech tagging and HMMs
- Parsing
- Partial parsing
- Semantic analysis
- Inference and world knowledge
- Information extraction
- Lexical semantics and word-sense disambiguation
- Discourse processing
- Generation
- Machine translation

Additional Course Info

- Time: Mondays and Wednesdays, 11:15-12:05
  - Possibly occasional Fridays
- Office hours: Monday 1-2, Thursdays 3-4
- Course Materials:
  - Lecture Notes, Readings, Assignments
  - Other Handouts
  - Lillian Lee's list of on-line NLP resources

Reference Material

- Required text book:
- Other useful references:
  - Others listed on course web page…
Prereqs and Grading

- **Prerequisites**
  - Elementary computer science background, elementary knowledge of probability, familiarity with context-free grammars, some background in machine learning.

- **Grading**
  - 30%: critiques of selected readings and research papers
  - 60%: final project. Grade based on
    - (1) preliminary project proposal (Mon 3/15),
    - (2) project literature survey (Mon 4/12),
    - (3) project presentation (study week: Mon 5/10, Weds 5/12),
    - (4) final write-up (Mon 5/17).
  - 10%: participation

Readings and Critiques

Information Sheet

- Please fill one out...