Natural Language Processing

Introduction

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Why NLP?

• Answer questions using the Web
• Translate documents from one language to another
• Describe what’s in an image or a video
• Do library research; summarize
• Manage messages intelligently
• Help make informed decisions
• Follow directions given by any user
• Fix a user’s spelling or grammar
• Grade exams
• Write poems or novels
• Listen and give advice
• Estimate public opinion
• Read everything and make predictions
• Interactively help people learn
Levels of Linguistic Knowledge

- spoken
  - phonetics
  - phonology
- written
  - orthography
  - morphology
  - syntax
  - semantics
  - pragmatics
  - discourse

“shallower”
“deeper”
第二阶段的奥运会体育比赛门票与残奥会开
闭幕式门票的预订工作已经结束，现在进入门票分配阶段。在此期间，我们不再接受新的
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spoken
- phonetics
- phonology

written
- orthography
- morphology
- syntax
- semantics
- pragmatics
- discourse

“shallower”

“deeper”
uygarlaştıramadıklarımızmizdanmıssınızınızcasına
“(behaving) as if you are among those whom we could not civilize”
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ambiguity
Today’s lecture is about models.

- Language models
- Hidden Markov models
- Probabilistic context-free grammars
What is a Model?

• An abstract, theoretical, predictive construct. Includes:
  – a (partial) representation of the world
  – a method for creating or recognizing worlds
  – a system for reasoning about worlds
• NLP uses *many* tools for modeling.
What about Brains?