Probabilistic Pronunciation + N-gram Models

CSPP 56553

Artificial Intelligence

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The ASR Pronunciation Problem

Given a series of phones, what is the most probable word?

Simplification: Assume phone sequence known, word boundaries known

Approach: Noisy channel model

Surface form is an instance of lexical form that has passed through a noisy communication path

Model channel to remove noise, find original

Bayesian Model

- $Pr(w|O) = Pr(O|w)Pr(w)/P(O)$
- Goal: Most probable word
  - Observations held constant
  - Find w to maximize $Pr(O|w)*Pr(w)$
- Where do we get the likelihoods? – $Pr(O|w)$
  - Probabilistic rules (Labov)
    - Add probabilities to pronunciation variation rules
      - Count over large corpus of surface forms wrt lexicon
- Where do we get $Pr(w)$?
  - Similarly – count over words in a large corpus