Prelim Notes

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1. Natural Language Processing and Speech

1.1. Chapter 1-4 (July 18)

Discussions

- Are n-grams defined over word forms or word roots ? Ans - application specific.
- Good-Turing smoothing : we derived Eq 4.27 using Eq 4.26 and briefly discussed the approximation used for larger N (Simple-Good turing)
- Brief discussion of interpolation and katz-backoff.
- Discussed back-off in Kneser Ney. An unanswered question was regarding implementation of back-off from n-grams to (n-1)-grams for $n > 1$ (do we use context or back-off to Kneser-Ney probabilities ?)

Topics for Review

- Kneser-Ney
- Perplexity
- Good Turing (formula)

1.2. Chapter 5-9 (July 22)

Discussions

- Maximum entropy Markov model (how this differs from hidden Markov model)
- Hidden Markov model speech recognition (how the model works)

Topics for Review

- Part of speech tagging (hidden Markov models and rule based)
- Maximum entropy and maximum entropy markov models
- features for speech (pitch, amplitude, spectrograms, formants)
- Cepstrum
- Speech recognition with hidden Markov model

2. Artificial Intelligence

2.1. Chapter 1-5 (July 22)

Discussions

- variants of A* (limited memory, weighted, $LRTA^*$)
- And-or search trees (their different uses)
- alpha-beta pruning (work through an example)

Topics for Review

- BFS, DFS, A*, limited-memory A*
- Iterative deepening DFS
- Heuristics for A*
- Simulated annealing, evolutionary algorithms
- And-or search trees
- LRTA*
- Minimax
- Alpha-beta pruning
- Expectimax