Topics: the prediction operation of Earley’s algorithm; restricted but probabilistic variants of CFGs.

Announcements: The final exam is scheduled for Friday May 18, 2:00-4:30pm, Phillips 219.

I. An alternative interpretation of parse states \((A \rightarrow \alpha \bullet \beta, i, j)\): the branch \(A \rightarrow \alpha \beta\) is part of a (partial) parse where

- the part of the sentence that the entire branch “covers” starts with \(x_i\), and
- the part of the sentence that the pre-dot stuff \(\alpha\) covers ends at (and includes) \(x_j\).

II. Example Suppose the CFG has the following rewrite rules (plus others, assumedly), where “duck” is a terminal:

\[
S \rightarrow A \ B \ C \ D \\
C \rightarrow E \ F \\
E \rightarrow \text{duck} \\
C \rightarrow H \ I \\
A \rightarrow B
\]

III. Bigram models A bigram CFG would take the following form:

- Terminals: \(w_1, w_2, \ldots, w_m\)
- Nonterminals: \(S, V_1, V_2, \ldots, V_m\)
- Start symbol: \(S\)
- Rewrite rules: all rewrite rules of the form
  
  1. \(V_i \rightarrow w_i V_j\),
  2. \(V_i \rightarrow w_i\), or
  3. \(S \rightarrow V_i\)
  
  where \(1 \leq i, j \leq m\).

IV. Sentence-ranking example A classic from the speech-recognition literature.

1. It’s hard to recognize speech.
2. It’s hard to wreck a nice beach.