Lecture 26

-Feature structures of augmented grammar and unification of feature structures

Feature structures

- Matrix of Feature-Value pairs

$$\begin{bmatrix} \text{FEATURE}_1 & \text{VALUE}_1 \\ \text{FEATURE}_2 & \text{VALUE}_2 \\ \vdots \\ \text{FEATURE}_n & \text{VALUE}_n \end{bmatrix}$$

- Example: NP➔Det Noun

  (the dog)

$$\begin{bmatrix} \text{CAT} & \text{NP} \\ \text{NUMBER} & \text{SG} \\ \text{PERSON} & 3 \end{bmatrix}$$

- Agreement features

  S➔NP VP (unification of FS)

  (the dog ran)

$$\begin{bmatrix} \text{CAT} & \text{NP} \\ \text{AGREEMENT} & \begin{bmatrix} \text{NUMBER} & \text{SG} \\ \text{PERSON} & 3 \end{bmatrix} \end{bmatrix}$$

Unification of feature structures (only if features match!)

- Success

$$\begin{bmatrix} \text{NUMBER} & \text{SG} \end{bmatrix} \sqcup \begin{bmatrix} \text{NUMBER} & [] \end{bmatrix} = \begin{bmatrix} \text{NUMBER} & \text{SG} \end{bmatrix}$$

$$\begin{bmatrix} \text{NUMBER} & \text{SG} \end{bmatrix} \sqcup \begin{bmatrix} \text{PERSON} & 3 \end{bmatrix} = \begin{bmatrix} \text{NUMBER} & \text{SG} \\ \text{PERSON} & 3 \end{bmatrix}$$

- Failure

$$\begin{bmatrix} \text{NUMBER} & \text{SG} \end{bmatrix} \sqcup \begin{bmatrix} \text{NUMBER} & \text{PL} \end{bmatrix} \; \textit{Fails!}$$