

Speech and visual information

**Detecting Object
Teaching Utterances
(Online)**

Speech and image preprocessing

Utterance classification (SVM)

A set of segmented object image features and sentence pairs

**Learning Object Image
Concept and Word Pairs
(Batch)**

Clustering object and sentence pairs (MHDP)

Selecting object image concept and word pairs (tf-idf)

A set of object image concept and word pairs

