# Automatic speech recognition (ASR) using Discriminative Direct Decoder (DDD) models with a mixture of Dirichlet Latent state

Assume the time horizon is discretized to intervals . Automatic speech recognition is about to predict a sequence of words from the vocabulary, by observing a sequence of acoustics observed features . Here our aim is to identify the optimal sequence such that

This means, look for all possible sequences of words (with limited maximum length) and finds one that matches the input acoustic observed features the best. This approach is known as discriminative approach which due to its large computational complexity of discriminative models wasn’t efficient until recently with emergence of DNNs these approaches got significant attention and also showed dramatic improvement specially in the reverse problem (speech generation from word sequences).

* Adaptive history length based on each state realization