Hidden Markov Models

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ML 2 BDA3321

Applications of HMMs

1. Automatic Speech Recognition
2. Activity Recognition
3. Part of Speech Tagging
4. Gene Finding

Types of inference in HMMs

1. **Filtering**
   It means to compute the belief state $p(z_t|x_{1:t})$ as the data streams in. This reduces noise more than just the hidded state using $p(z_t|x_t)$.
2. **Smoothing**
   This means to compute $p(z_t|x_{1:T})$, given all the evidence. Bu conditioning on the past and future data, the uncertainity is significantly reduced.
3. **Fixed Lag Smoothing**
   This invloves computing $p(z_{t-l}|x_{1:t})$, where $l > 0$ is called lag. Thisgives better performance than filtering, but with a slight delay.

Types of inference in HMMs cont.

1. **Prediction** Here we compute $p(z_{t+h}|x_{1:t})$, where $h > 0$ is callled the prediction horizon. This prediction is about a future hidden state.

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