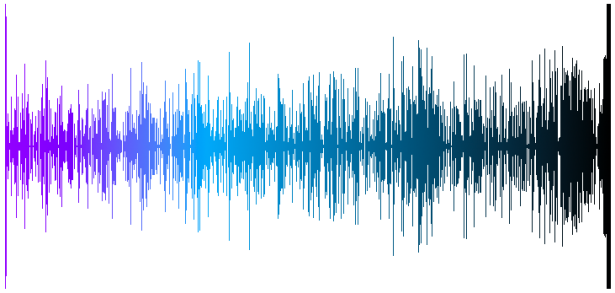
1 Session 17. Hidden Markov Models

HMMs are probably the most popular directed graphical model out there. They are used in many sequential and temporal domains:

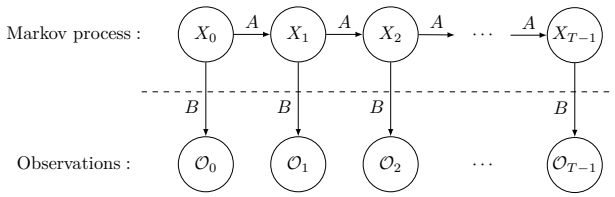
- speech recognition,
- handwriting recognition,
- visual target tracking and localization,
- machine translation,
- robot localization,
- gene prediction,
- time-series analysis,
- natural language processing and part-of-speech recognition,
- stochastic control,
- protein folding, ...

In HMMs, the random variables are divided into hidden states (phonemes, letters, target location) and observations (audio signal, pen strokes, target image). The goal is to predict the states from observations.

What is this?



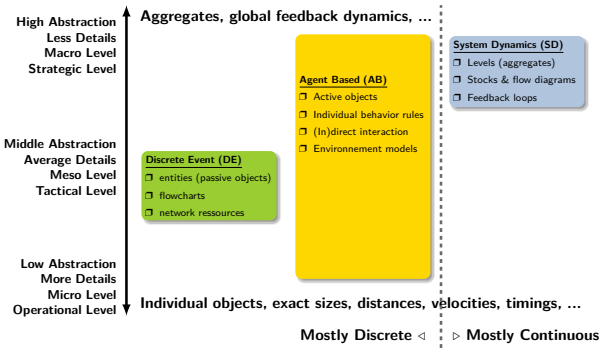
We can start wth the graphical representation of the HMM



To learn more on HMM:

- `https://alliance.seas.upenn.edu/~cis520/wiki/index.php?n=Lectures.HMMs#toc7`
- `http://www.columbia.edu/~mh2078/MachineLearningORFE/HMMs_MasterSlides.pdf`

1.1 Discrete Evenet Simulations (DES)



Taken from `https://texample.net/tikz/examples/simulation-abstraction/`

References