Lecture 1 - intro

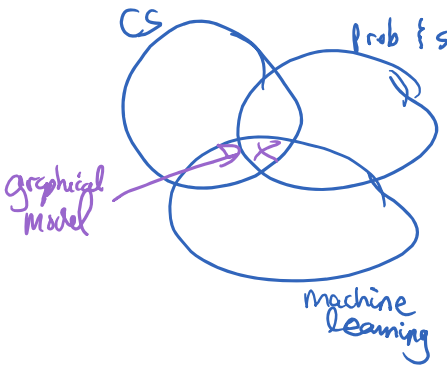
Tuesday, September 6, 2022 9:44 AM

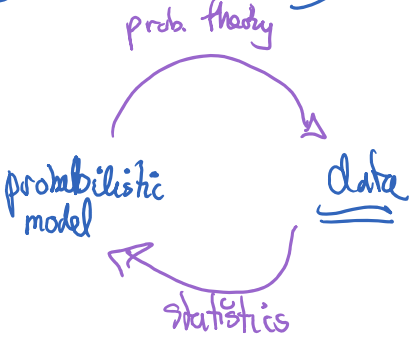
email sign-up by Thursday evening : bit.ly/IFT6269-F22

probabilistic graphical model :

model multivariate data

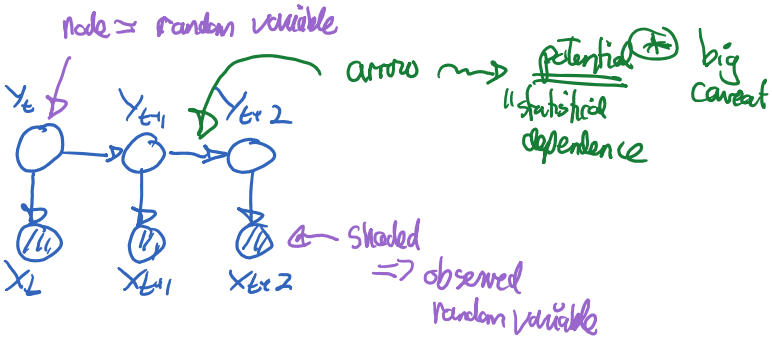
graphical model → mix of graph theory + probability theory (CS)





Applications :

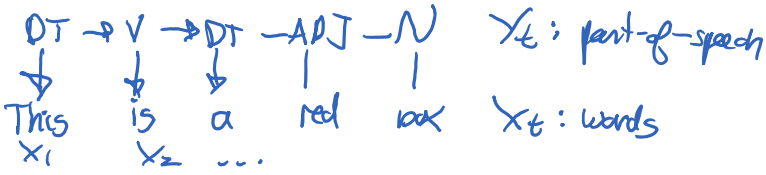
hidden Markov model (HMM)



a) speech recognition : X_t → sound waves (observed)

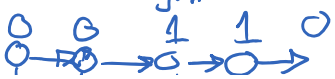
Y_t → phoneme (latent)

b) part-of-speech tagging :



c) gene finding X_t → DNA

Y_t : coding vs. non-coding region $Y_t \in \{0,1\}$



matrices

d) control $\quad y_{t+1} = A y_t + B v_t + \varepsilon_t$ $\quad$ where x_t & y_t are cts. vectors

control term $\quad$ noise

$x_t = C y_t + \varepsilon_t'$ $\quad$ if ε_t & ε_t' is Gaussian

HMM → "Kalman filter"