Monday, October 26, 2015 12:00 PM

$p(AB) = p(A|B) \cdot p(B)$

$p(x_1, \pi_1) = p(x_1|\pi_1) \cdot p(\pi_1)$

$p(x_2\, \pi_2|\pi_1)$

$= p(x_2|\pi_2, \pi_1) \cdot p(\pi_2|\pi_1)$

$= p(x_2|\pi_2) \cdot p(\pi_2|\pi_1)$

$P(X, \pi)$

$= P(x_N, \pi_N \mid \pi_{N-1})\, P(x_{N-1}, \pi_{N-1} \mid \pi_{N-2}) \ldots\ldots P(x_2, \pi_2 \mid \pi_1)\, P(x_1, \pi_1) =$

$\underbrace{P(x_N \mid \pi_N)}\, \underbrace{P(\pi_N \mid \pi_{N-1})} \ldots\ldots \underbrace{P(x_2 \mid \pi_2)\, P(\pi_2 \mid \pi_1)}\, \underbrace{P(x_1 \mid \pi_1)\, P(\pi_1)}_{e_{\pi_1}(x_1)} =$

$\underbrace{a_{0\pi 1}}_{p(\pi_1)}\, a_{\pi 1 \pi 2} \ldots\ldots a_{\pi N-1 \pi N}\, e_{\pi 1}(x_1) \ldots\ldots e_{\pi N}(x_N)$

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Given a sequence $x = x_1 \ldots\ldots x_N$
and a parse $\pi = \pi_1, \ldots\ldots, \pi_N$, $\Rightarrow P(\pi \mid x)$

To find how likely is the parse:
(given our HMM)

Poisson

exp. distr. $P(X \leq x) = 1 - e^{-\lambda x} = y$

$\Rightarrow \quad x = -\frac{1}{\lambda} \ln(1-y)$

$t = s$

$t' = s + \left(- \frac{\ln(1-y)}{\lambda} \right)$