



	Recognition	Discovery & parameter inference	Parameter instantiation
Data	Unlabeled	Unlabeled	labeled
PSSMs (no gaps)	$\sum_{i=1}^L s[o + i, i]$	Gibbs sampler	$S[a, i] = \log_2 \frac{1 \cdot r[a, i] + b}{p_a (k + \Sigma b)}$
HMMs (gaps)	<p>Viterbi decoding:</p> <ul style="list-style-type: none"> most likely path, Q^* Viterbi <p>Posterior decoding:</p> <ul style="list-style-type: none"> most likely states, $\hat{q}_1 \dots \hat{q}_T$ Forward, Backward 	Baum Welch	<p>MLE:</p> $a_{ij} = \frac{A_{ij}}{\sum_p A_{ip}}$ $\sigma_i(a) = \frac{E_i(a) + b}{\sum_x E_i(x) + \Sigma b}$

