

The diagram shows the equation $\mathbb{P}(x_n^p \mid \tilde{D}) = \sum_{x_p} \mathbb{P}(x_p \mid \tilde{D}) \left\{ \sum_{\{\mathbf{x}^p: x_n^p = x\}} \mathbb{P}(\mathbf{x}^p \mid x_p) \right\}$. Annotations include: a dashed arrow from the text "It's parent state given the data" pointing to $\mathbb{P}(x_p \mid \tilde{D})$; a dashed arrow from the text "Gene state given the data" pointing to x_n^p ; and a dashed arrow from the text "ways to get there" pointing to the inner summation set $\{\mathbf{x}^p: x_n^p = x\}$.

$$\mathbb{P}\left(x_n^p \mid \tilde{D}\right) = \sum_{x_p} \mathbb{P}\left(x_p \mid \tilde{D}\right) \left\{ \sum_{\{\mathbf{x}^p: x_n^p = x\}} \mathbb{P}\left(\mathbf{x}^p \mid x_p\right) \right\}$$

It's parent state given the data

Gene state given the data

ways to get there