Lecture 16: Classification

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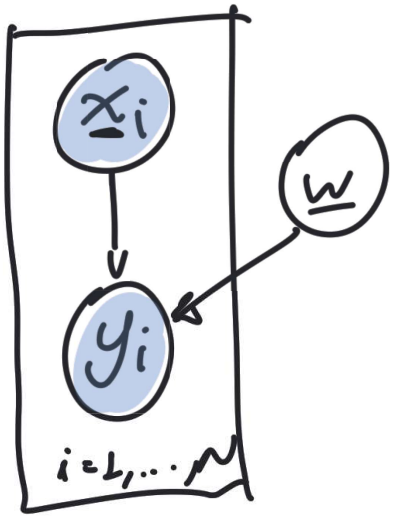
Logistic regression with many features

Combining logistic regression with generalized linear models



vector

$$\underline{x}_i \in \mathbb{R}^D \; ; \; \underline{x}_i = (x_{i1}, x_{i2}, \dots, x_{iD})$$

$$p(y_i = 1 \mid \underline{x}_i, \underline{w}) = \text{sigm}(w_0 + w_1 x_{i1} + w_2 x_{i2} + \dots + w_D x_{iD})$$

$$\underline{w} = (w_0, w_1, \dots, w_D) \in \mathbb{R}^D$$

these could be linear or nonlinear functions

$$\varphi_1(\underline{x}), \dots, \varphi_M(\underline{x})$$

Generalized Linear Model. ✶

$$p(y_i = 1 \mid \underline{x}_i, \underline{w}) = \text{sigm}\left(\sum_{j=1}^{M} w_j \varphi_j(\underline{x}_i)\right)$$

$$\underline{w} = (w_1, \dots, w_M) \in \mathbb{R}^M$$