

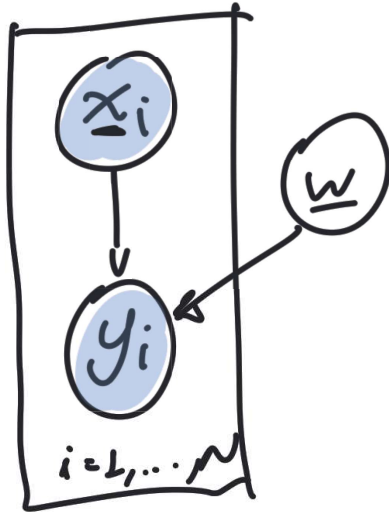
Lecture 16:

Classification

Professor Ilias Bilonis

Logistic regression with many features

Combining logistic regression with generalized linear models



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

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

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

$$\phi_1(\underline{x}), \dots, \phi_M(\underline{x})$$

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

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

Generalized
Linear Model.