

Multiple Linear Regression.

predictors / explanatory r.v.s: $(X_1, X_2, \dots, X_p)^T =: X$

response r.v. Y

In general: $Y = f(X) + \varepsilon$ w/ $\varepsilon \sim N(0, \sigma^2)$
and $X \perp \varepsilon$

$$Y = \underbrace{\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}_{\beta \cdot X} + \varepsilon$$

equation for a p -dimensional
hyperplane in $(p+1)$ -dimensional space