Inequalities

Blah blah

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Assume we have i.i.d samples $X_i \in \{0, 1\}$ from a Bernoulli distribution with mean p

Hoeffding's inequality

$$P(\frac{1}{n}\sum_{i=1}^{n} X_i - p \geq \epsilon) \leq e^{-2n\epsilon^2} \tag{1}$$

Chebyshev

$$P(\frac{1}{n}\sum_{i=1}^{n} X_i - p \geq \epsilon) \leq \frac{1}{\epsilon}\sqrt{\frac{p(1-p)}{n}} \tag{2}$$

Chernoff

$$P(\frac{1}{n}\sum_{i=1}^{n} X_i - p \geq \epsilon) \leq e^{-nD(p+\epsilon||p)} \tag{3}$$