

Dealing With Uncertainty

$$P(X|E)$$

Probability theory

The foundation of Statistics

Chapter 13

History

- Games of chance: 300 BC
- 1565: first formalizations
- 1654: Fermat & Pascal, conditional probability
- Reverend Bayes: 1750's
- 1950: Kolmogorov: axiomatic approach
- Objectivists vs subjectivists
 - (frequentists vs Bayesians)
- Frequentist build one model
- Bayesians use all possible models, with priors

Concerns

- Future: what is the likelihood that a student will get a CS job given his grades?
- Current: what is the likelihood that a person has cancer given his symptoms?
- Past: what is the likelihood that Marilyn Monroe committed suicide?
- Combining evidence.
- Always: Representation & Inference