

Bayes' rule

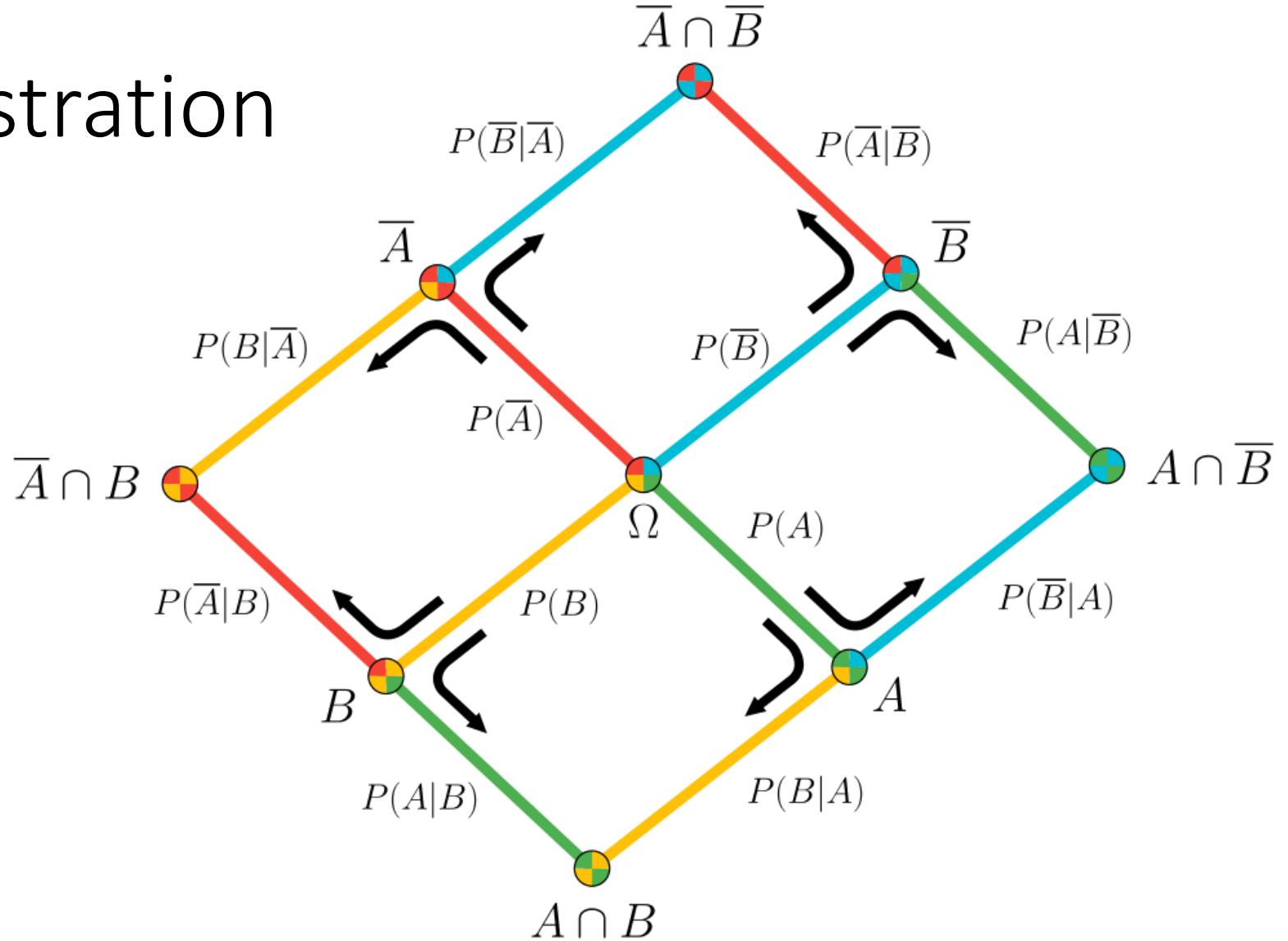
Achilleas Tsakpinis

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Conditional probability

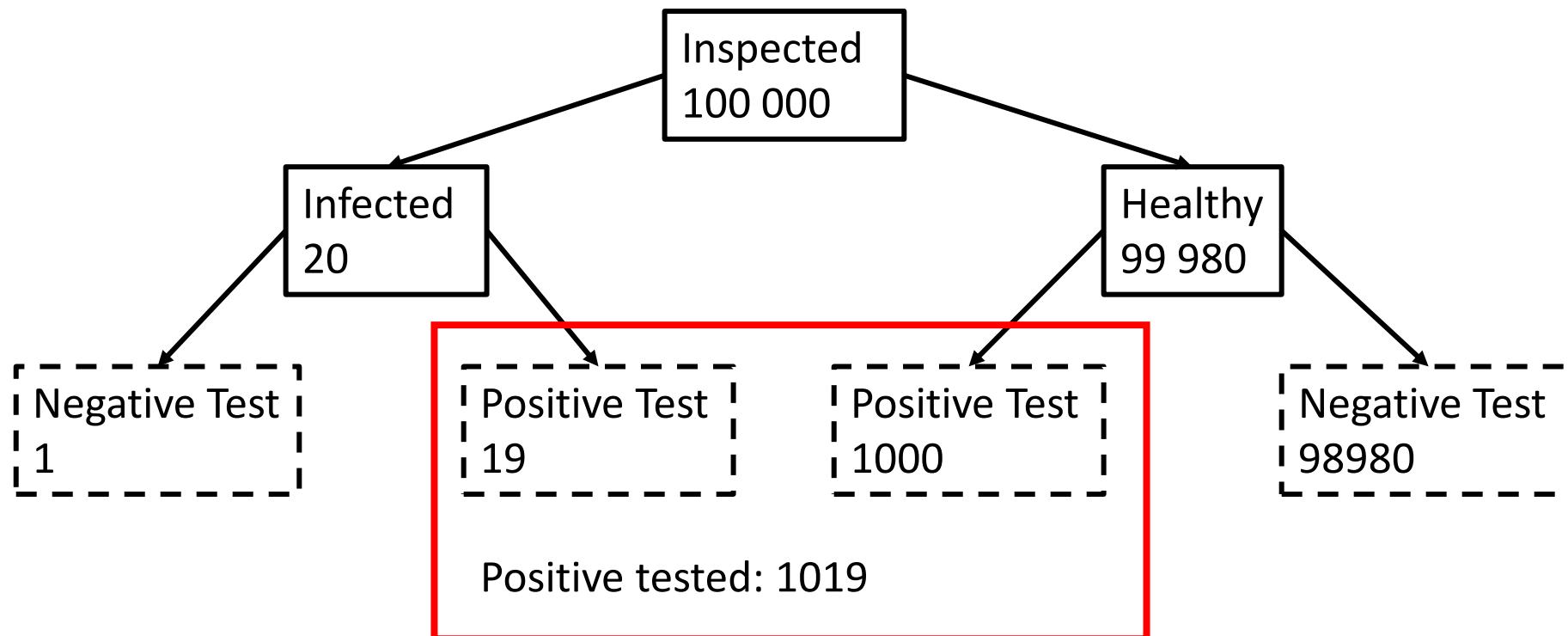
- $P(A|B) = \frac{P(B|A)*P(A)}{P(B)}$
- “Probability of event A with the condition that event B already occurred”

Graphical illustration



$$P(A|B) \cdot P(B) = P(A \cap B) = P(B|A) \cdot P(A)$$

Conditional probability example



$$P(I \mid T) \approx \frac{19}{1019} \approx 0,0186$$

Conditional probability example

- $P(+|Alcohol) = 0.99$
 - $P(+|No Alcohol) = 0.03$
 - $P(Alcohol) = 0.05$
- $P(No Alcohol) = 0.95$
- $P(+) = P(Alcohol) * P(+|Alcohol) + P(No Alcohol) * P(+|No Alcohol)$
= 0.07
- $P(Alcohol|+) = \frac{P(+|Alcohol)*P(Alcohol)}{P(+)} = 0.63$