Conditional Independence

- Unconditional (absolute) independence very rare

- *Conditional independence is our most basic and robust form of knowledge about uncertain environments.*

- X is conditionally independent of Y given Z

$$X \perp\!\!\!\perp Y \mid Z$$

if and only if:

$$\forall x, y, z : P(x, y \mid z) = P(x \mid z)P(y \mid z)$$

or, equivalently, if and only if

$$\forall x, y, z : P(x \mid z, y) = P(x \mid z)$$