

$$\begin{array}{l} ? \\ A \in \\ A \\ \Gamma(A) \subset \\ A \\ A \setminus \\ (\{A\} \cup \\ \Gamma(A)) \\ \exists x : \\ A \xrightarrow{\quad} \\ (0,1): \end{array}$$

$$\forall A \in A : \Pr[A] \leq x(A) \prod_{B \in \Gamma(A)} (1-x(B))$$

$$\Pr(\cap_{A \in A} \overline{A}) \geq \prod_{A \in A} (1-x(A))$$

$$\begin{array}{l} ?? \\ \updownarrow \\ \Pr\left(A|\cap_{B \in S} \overline{B}\right) \leq \\ x(A) \forall S \subset \\ \mathcal{A}, A \notin \\ S \\ S = \\ \emptyset \\ \Pr\left(A_i\right) \leq \\ x(A_i) \\ A \\ S_1 = \\ S \cap \\ \Gamma(A), S_2 = \\ SS_1 \end{array}$$

$$\Pr\left(A|\cap_{B \in S} \overline{B}\right) = \frac{\Pr\left(A \cap \cap_{B \in S_1} \overline{B} | \cap_{B \in S_2} \overline{B}\right)}{\Pr\left(\cap_{B \in S_1} \overline{B} | \cap_{B \in S_2} \overline{B}\right)}$$

$$\begin{array}{l} S_1 = \\ \{ \overline{B}_{j1}, B_{j2}, \dots, B_{jl} \} \\ A \\ S_2 \end{array}$$

$$Numerator \leq \Pr\left(A|\cap_{B \in S_2} \overline{B}\right) = \Pr(A) \leq x(A) \prod_{B \in \Gamma(A)} (1-x(B))$$

(1)

$$Denominator = \Pr\left(\overline{B}_{j1} | \cap_{t=2}^l \overline{B}_{jt} \cap_{B \in S_2} \overline{B}\right) \cdot \Pr\left(\overline{B}_{j2} | \cap_{t=3}^l \overline{B}_{jt} \cap_{B \in S_2} \overline{B}\right) \cdot \dots \dots \Pr\left(\overline{B}_{jl} | \cap_{B \in S_2} \overline{B}\right) \geq \prod_{B \in S_1} (1-x(B))$$

(2)

$$\begin{array}{l} |S| \\ ?? \\ ?? \end{array}$$

$$\Pr\left(A|\cap_{B \in S} \overline{B}\right) \leq x(A) \prod_{B \in \Gamma(A) - S_1} (1-x(B)) \leq x(A)$$

$$\begin{array}{l} \Pr\left(\overline{A}|\cap_{B \in S} \overline{B}\right) \geq \\ 1 - \\ x(A) \end{array}$$

$$\Pr\left(\overline{A_1} \cap \dots \cap \overline{A_n}\right) = \Pr\left(\overline{A_1} | \overline{A_2} \cap \dots \cap \overline{A_n}\right) \cdot \Pr\left(\overline{A_2} | \overline{A_3} \cap \dots \cap \overline{A_n}\right) \cdot \dots \cdot \Pr\left(\overline{A_n}\right) \leq \prod_{A \in \mathcal{A}} (1-x(A))$$

$$\begin{array}{l} ?? \\ ? \end{array}$$

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The  
same  
proof  
has  
been  
added  
by  
me  
in