

Modelling Knowledge

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1 States

States of the world ω capture all relevant features of the world, including higher-order facts about knowledge.

2 Events

An event E is a subset of Ω .

The complement of E is denoted $\neg E$.

3 Partitions

Each player i 's information is represented by a partition \mathcal{P}_i of Ω .

Player i knows in state ω that the event E holds iff $\mathcal{P}_i(\omega) \subseteq E$.

4 The Knowledge Operator

The set of states in which player i knows that the event E obtains is denoted by $K_i(E)$.

$K(E)$: the event that everyone knows that E .

$K^n(E)$ abbreviates $K(K^{n-1}(E))$.

5 Self-Evidence

The event F is *self-evident* iff $K(F) = F$.

6 Common Knowledge

The set of states in which E is *commonly known* is given by $K^\infty(E) := \bigcap_{n=1}^\infty K^n(E)$.