

Reichenbachian Common Cause Systems

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Abstract

A partition $\{C_i\}_{i \in I}$ of a Boolean algebra \mathcal{C} in a probability measure space (\mathcal{C}, p) is called a Reichenbachian common cause system for the correlated pair A, B of events in \mathcal{C} if any two elements in the partition behave like a Reichenbachian common cause and its complement, the cardinality of the index set I is called the size of the common cause system. It is shown that given any correlation in (\mathcal{C}, p) , and given any finite size $n > 2$, the probability space (\mathcal{C}, p) can be embedded into a larger probability space in such a manner that the larger space contains a Reichenbachian common cause system of size n for the correlation. It also is shown that every totally ordered subset in the partially ordered set of all partitions of \mathcal{C} contains only one Reichenbachian common cause system. Some open problems concerning Reichenbachian common cause systems are formulated.

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