

Cognitive Integrity Framework: Trust Calculus and Detection Bounds

This section presents the formal foundations of the Cognitive Integrity Framework (CIF). We define the system model (sec:system-model), cognitive state representation (sec:cognitive-state), integrity properties (sec:integrity-properties), trust calculus (sec:trust-calculus), and information-theoretic detection bounds (sec:detection-bounds).

System Model

Definition (Multiagent Operator)

A *multiagent operator* is a tuple:

$$\mathcal{O} = \langle \mathcal{A}, \mathcal{C}, \mathcal{S}, \mathcal{P}, \Gamma \rangle \quad (1)$$

where components are defined in tab:operator-components.

Table 1: Components of the multiagent operator \mathcal{O} .