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Searching for Functional Boundaries: Evaluating Effectiveness in Complex Adaptive Networks with Cognitive Dynamics.

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Abstract

The research focus on adaptivity in complex systems has propelled an exploration of diverse interactions characterized by state transition processes. However, the investigation of functional variances among processes, rooted in fundamental operands, remains insufficient. Recognizing this gap is crucial for unveiling the constituents of state transitions and their functional boundaries during ongoing adaptivity. To address this, our central focus is on quantifying the functional variance in the interactions of fundamental operands. This approach enables a systematic study of complex adaptive networks grounded in the dynamics of cognitive abilities, where elements adapt and evolve based on cognitive processes. To underscore this point, we emphasize translating ontologically irreducible networks into functionally representable ones at the meso-level, which is essential for assessing their effectiveness. Our active investigation during state transitions explores external interventions, aiming to shed light on mutual influences.