# EXPLORING THE IMPACT OF STRUCTURAL DYSCONNECTIVITY ON COGNITIVE COMPUTATION: A CONNECTOME-INFORMED RESERVOIR COMPUTING STUDY OF SCHIZOPHRENIA

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The mapping between brain structure and functional dynamics remains a fundamental challenge in computational neuroscience. Schizophrenia is increasingly conceptualized as a "dysconnectivity syndrome," characterized by distributed alterations in neural wiring and a decreased capacity for functional integration. Recent neuroimaging studies using graph theory have identified a specific "affected core" within the schizophrenic connectome—a set of regions, including prefrontal and subcortical areas, that drive the loss of global network efficiency. This study utilizes Connectome-informed Reservoir Computing (RC) to explore how these specific topological impairments influence cognitive task performance. By integrating human connectome data into the RC framework, our aim is to simulate how the structural degradation of the "affected core" shifts the system's dynamical regimes and impacts its ability to process memory-related tasks. Preliminary results reveal no significant difference in memory capacity when evaluated at the whole-brain scale. This finding strongly suggests that global network dynamics may dilute localized deficits, highlighting the necessity for advanced matrix preprocessing and more targeted topological investigations.

## References

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