

# **Mining Sequential Brain Cognitive Activity Components by Residue Iteration Decomposition (RIDE)**

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The overlapping of sequential cognitive processes with fluctuating jitters leads to an obstacle in cognitive research using event-related potentials (ERP), which is smeared due to the trial-to-trial variability. The smearing makes the identification of the exact spatiotemporal representation of neural activities that reflect functional-specific sub-processes difficult. Methods for un-mixing ERP components associated with sub-psychological events are in demand. Limitations are shown in previous methodologies due to improper assumptions that do not reflect the realistic brain activity. We present a robust method – Residue Iteration Decomposition (RIDE) – to decompose temporally overlapping components that are significantly coupled with different psychological events, based on different event-locking of each component from trial to trial. RIDE shows potentials on exploring brain working mechanisms by providing a new analysis approach on trial-to-trial variability, individual differences and brain disease researches.

## **References**

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