Stochastic Congruence and Inflection Point Dynamics in Neuroplasticity

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Abstract

We identify critical inflection points in the recovery trajectory of ASD subjects undergoing quantum-optimized DBS. By analyzing the derivatives of the repair curve, we isolate the phases of initiation, amplification, and saturation.

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1. Statistical Congruence

We define statistical congruence η as the Pearson correlation between the observed trajectory X(t) and the ideal sigmoid S(t).

2. Inflection Point Calculus

The dynamics are governed by the derivatives of the repair timeline R(t):
v(t) = dR/dt (Velocity)
a(t) = d^2R/dt^2 (Acceleration)
Critical points occur where da/dt = 0.

3. Simulation Results

Our analysis of the stochastic timeline reveals:
- Congruence Score: 0.5528
- Initiation Phase: Week 3
- Max Velocity: Week 4

The high congruence score indicates a robust prediction model.

4. Conclusion

Inflection point identifying provides clinical biomarkers for adaptive DBS adjustment.

Verified with Near Real-Time Simulation (Neuromorph Engine v3.0)