



fNIRS-Based Machine Learning for Parkinson's Motor Subtype Classification



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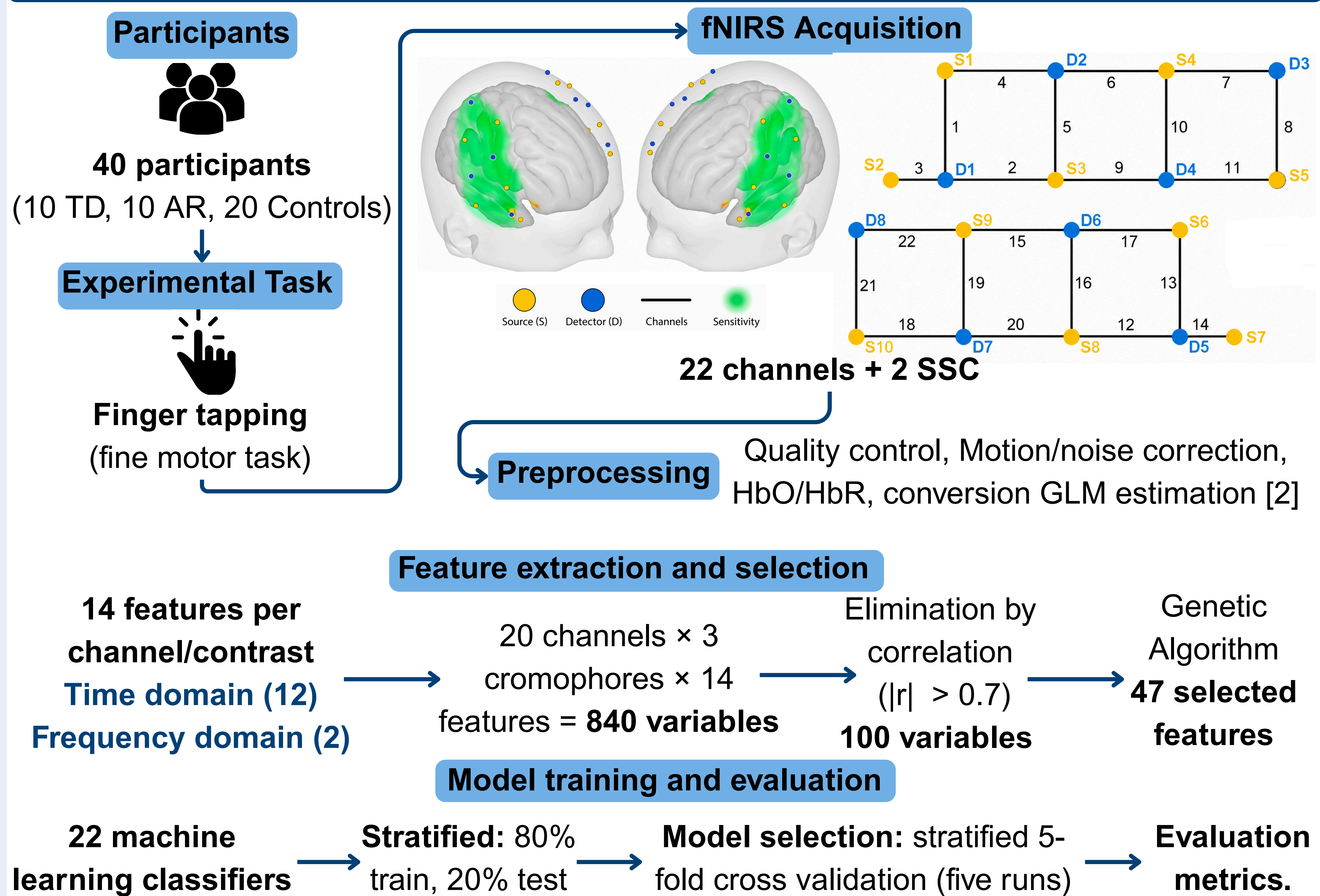
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I. INTRODUCTION

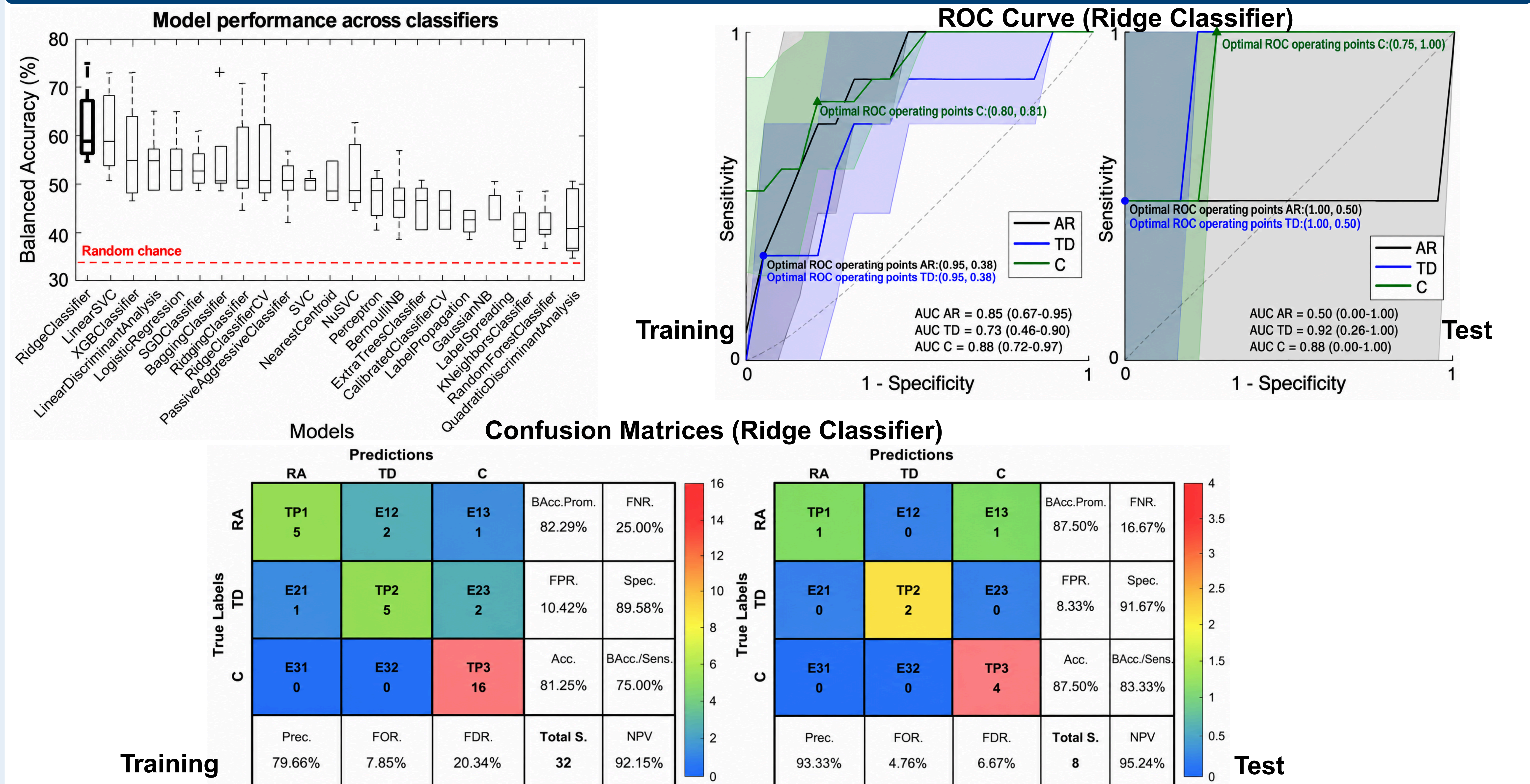
Parkinson's disease (PD) is a heterogeneous neurodegenerative disorder with distinct motor subtypes, mainly tremor-dominant (TD) and akinetic-rigid (AR), which differ in clinical features, progression, and treatment response [1]. However, current subtype classification relies largely on clinical assessment and expert judgment, introducing subjectivity and inter-rater variability.

Functional near-infrared spectroscopy (fNIRS), combined with machine learning, provides a quantitative approach to assess cortical hemodynamics during motor tasks and may support the differentiation of PD subtypes and healthy controls.

II. METHODS



IV. RESULTS



V. CONCLUSIONS

fNIRS + machine learning enabled multiclass differentiation of TD, AR, and controls. Ridge achieved 75% training and 83.33% test balanced accuracy using 47 selected features, supporting this approach for objective PD motor subtype characterization.

Acknowledgments

Grateful acknowledgment to the Society for fNIRS for the Travel Award and to SECIHTI for the Master's scholarship supporting this research.