



Contribution ID: 7

Type: **not specified**

## Temporal Phenotyping of ALS Patients using Machine Learning

*Thursday, 27 June 2024 14:25 (15 minutes)*

Amyotrophic Lateral Sclerosis (ALS) is a rapidly progressive neurodegenerative disorder characterized by progressive loss of motor neurons in the brain and spinal cord, leading to muscular weakness and ultimately death. Life expectancy is 3 to 5 years after disease onset, there is no cure and disease heterogeneity make it difficult to understand its underlying mechanisms. This research project aims to enhance the understanding of ALS progression over time through advanced ML techniques, focusing on leveraging longitudinal patient data, including phenotype information and clinical records, to identify distinct phenotypic clusters within ALS trajectories. By adapting and extending existing models such as LATTE and CAMELOT, the research explores novel approaches to capture temporal patterns, feature importance, and cluster assignments in ALS patients. The methodology involves preprocessing steps, classifier performance evaluations, and the incorporation of innovative attention mechanisms to improve interpretability and accuracy in predicting disease outcomes. Through this comprehensive analysis, this study will contribute with valuable information about ALS progression and provide new prognostic information for better patient care and management.

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