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**Project Title**

Identifying genetic risk variants and developing a deep learning prediction model for disability development in the elderly: a study using the Canadian Longitudinal Study on Aging

**Project Summary**

Disability in the elderly is a significant health issue with a growing impact on health-care costs. Identifying the genetic risk variants associated with disability development could advance our understanding of biological mechanisms related to aging. The Canadian Longitudinal Study on Aging (CLSA) provides a unique opportunity to investigate this association due to its comprehensive data collection, including genetic and non-genetic variables. Our study aims to identify genetic variants associated with disability development through genome-wide association studies and build an accurate prediction model for disability using deep learning techniques. We will analyze the CLSA data using copula-based joint survival models, perform genome-wide tests for disability, and develop a deep learning prediction model using genetic and non-genetic information. This research could lead to breakthroughs in early prevention and treatment of disability in the elderly.

**Keywords**

disability, genome-wide association studies, GWAS, deep learning