**Analyzing the Impact of Financial Stability and Family Structure on Elder Health and Longevity: A Machine Learning Approach Using the RAND HRS Longitudinal File 2020**

Yuzhen Zhou, Zeyuan Pang

**Abstract**

The goal of this project is to investigate how elders' health and longevity are affected by their financial and family situations, which are important issues in the face of global aging trends. Using machine learning methods on the RAND HRS Longitudinal File 2020 (V1) dataset, we aim to discover patterns and insights that can help design better health and social policies for the aging population. The research will focus on finding out how financial and family factors impact elders' health outcomes and life expectancy, adding to a deeper understanding of aging dynamics.

**Project Description**

**Problem Definition**

The main objective of our study is to examine the effects of financial stability and family structure on the health and lifespan of older adults. This inquiry is vital as countries around the world deal with issues related to an aging population, such as increased healthcare demands, pension viability, and the social well-being of older adults. This study aims to inform policy-making in healthcare, social security, and family support programs, guiding choices towards more efficient ways of supporting older adults.

By exploring the link between economic condition, family composition, and elder health, we can suggest specific interventions that enhance quality of life, lower healthcare expenses, and foster sustainable aging societies.

We are committed to this project as it addresses a major challenge for China: the rapid aging of its population. This demographic shift has significant implications for the social and economic development of the country, and requires innovative solutions to ensure the well-being of the elderly and their families.

**Methods**

The RAND HRS Longitudinal File 2020 (V1) is a dataset that provides anonymized information on U.S. residents over 50 years old. It includes data on their demographics, income, family structure, health status, and insurance coverage. We will use this dataset to analyze how financial stability, family structure, and health outcomes are related among the elderly.

We will use Descriptive Analytics to profile the current situation of the elder population in terms of their finances, family, health, and longevity. We will also use Predictive Analytics to build machine learning models, such as regression analysis, to forecast health outcomes based on financial and family factors. Additionally, we could use Prescriptive Analytics to suggest policy interventions or support mechanisms.

We will experiment with different machine learning models, such as linear regression for continuous health outcomes. We will measure the performance of our models using metrics such as R-squared, RMSE, accuracy, precision, and recall.