Applying Machine Learning in the Gait Analysis and Physiological Signals in Early Dementia

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Background
Taiwan has now entered an aging society. In the research on delaying aging, many scholars have put forward the viewpoints of successful aging, active aging and productive aging.

Aims & Objectives
To propose a clinical AI model that integrates precise diagnosis, screening and prognosis evaluation models, and develops a new milestone that can be clinically used in the evaluation of dementia patients.

Methods
We try to apply AI technology to establish early detection and early intervention mechanisms for dementia. This study was collected from the database of the Day-care Center for Geriatrics in Some Southern Taiwan Regional Hospital, involving 133 elderly people from December 2019 to December 2020. After preprocessing and exclusion, the remaining 77 participants were eligible. In this study, some algorithms for multiple classification models to identify elderly MCI patients were applied.

Results
It is feasible to use algorithms to classify the MCI of mixed gait analysis parameters and physiological signals, and XGBoost has the highest classification efficiency (AUC=0.908).

Discussion & Conclusion
The mixed gait analysis parameters and physiological signal prediction model are used to classify the elderly who may have MCI. This can help doctors focus on MCI patients, prevent them from progressing to dementia, and reduce the physical and mental burden on patients' families.