



Care

## AI and exercise intervention to improve life for people with younger-onset dementia



### What is the focus of the research?

Developing innovative software that detects younger-onset dementia (YOD) and delivering an exercise program that alleviates symptoms.



### Why is this important?

People diagnosed with younger-onset dementia often face considerable challenges, as many people still have active lives, young families and careers.

Diagnosing younger-onset dementia is a lengthy process because its clinical symptoms are more diverse compared to dementia in older adults.

Unfortunately, most research projects and support services are geared towards people diagnosed with dementia in older age.

Dr Ghahramani aims to rectify this by developing multimodal, AI-driven software that can recognise younger-onset dementia in people. She will then design a personalised, 12-week, at-home exercise program with the goal of improving their motor function and other markers of disease.

Exercise-related research on older people living with dementia has shown promising results. Excitingly, Dr Ghahramani's project will be the first of its kind, since there are currently no exercise interventions designed specifically for people living with younger-onset dementia.

This project's outcomes may significantly improve quality of life for people and their families.



## How will it happen?

**Stage 1:** ask participants with and without younger-onset dementia to perform a series of cognitive and motor tasks. Record brain activity and motion data to understand how dementia affects the brains and bodies of younger people.

**Stage 2:** use the data to build the software to identify biomarkers of younger-onset dementia.

**Stage 3:** divide participants with detected younger-onset dementia into either an intervention or a control group. Exercise physiologist to deliver intervention group a customised 12-week exercise program.



## What will it mean for people with YOD?

- First-ever software that can possibly detect younger-onset dementia.
- Exercise intervention specifically designed for younger people with dementia.
- Non-pharmacological method of alleviating symptoms and improving quality of life.

## Who's undertaking the research?

**Dr Maryam Ghahramani, University of Canberra**



Dr Ghahramani is an expert in machine learning and bio-signal processing for human motion, balance and motor function assessment. Her doctoral research at the University of Wollongong, supported by Illawarra Shoalhaven Local Health District, laid the foundation for her expertise.

Since 2020, as a lecturer at the University of Canberra, Dr Ghahramani has led multidisciplinary research projects focusing on motion, balance and motor function assessment. She uses machine learning and bio-signal processing to detect conditions such as Parkinson's disease, younger-onset dementia and hypoxia.

Dr Ghahramani collaborates with industry for the development and enhancement of balance and motor function assessment device technologies.

The title of Dr Ghahramani's project is *A Pilot Study on Younger Onset Dementia Detection Using Machine Learning and the Impact of a 12-week Home-Based Exercise Program for Enhancing Motor Function in Younger Onset Dementia*.