**CUSO** WINTER SCHOOL 2022
31 January - 4 February, *Champéry, Switzerland*
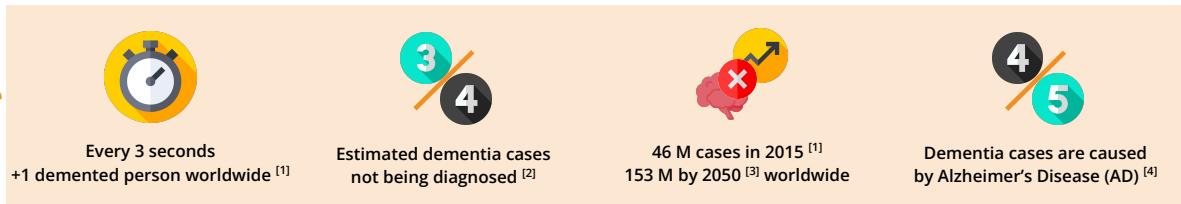
QoLife Technologies · UNIVERSITÉ DE GENÈVE · CENTRE UNIVERSITAIRE D'INFORMATIQUE

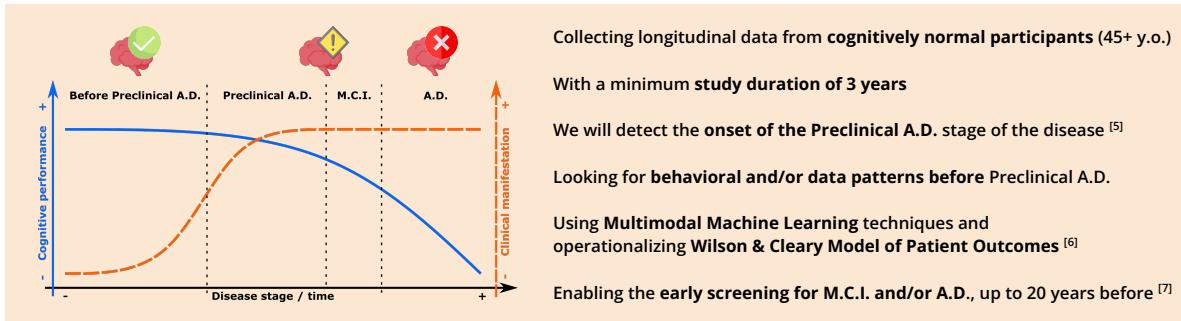# Fighting Alzheimer's Disease Effortlessly

PR VIDEMUS [alz]

**Multimodal Machine Learning for Ubiquitous Preclinical Alzheimer's Disease Early Screening**

Igor Matias [M.Sc.], Prof. Matthias Kliegel [Ph.D.], Prof. Katarzyna Wac [Ph.D.]
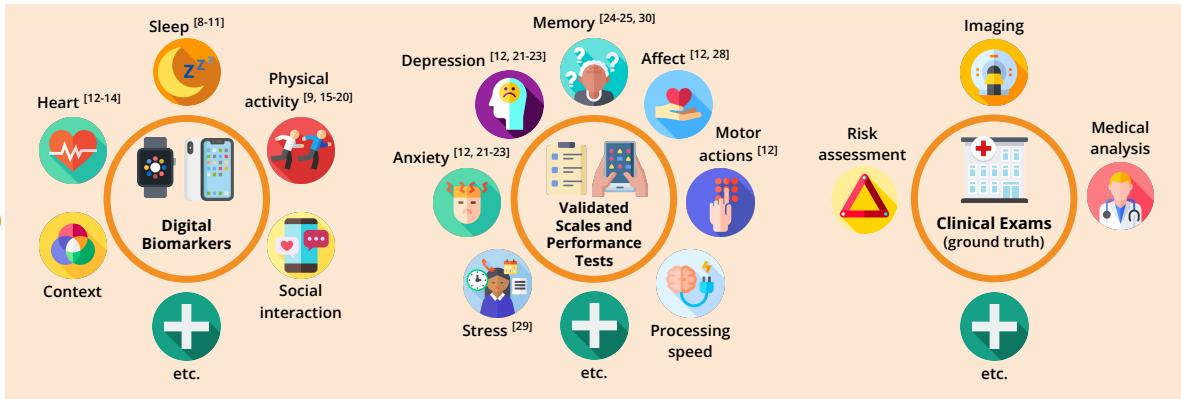
## Why?



Every 3 seconds
+1 demented person worldwide [1]

3/4 Estimated dementia cases not being diagnosed [2]

46 M cases in 2015 [1]
153 M by 2050 [3] worldwide

4/5 Dementia cases are caused by Alzheimer's Disease (AD) [4]

## How?



Collecting longitudinal data from **cognitively normal participants** (45+ y.o.)

With a minimum **study duration of 3 years**

We will detect the **onset of the Preclinical A.D.** stage of the disease [5]

Looking for **behavioral and/or data patterns before** Preclinical A.D.

Using **Multimodal Machine Learning** techniques and operationalizing **Wilson & Cleary Model of Patient Outcomes** [6]

Enabling the **early screening for M.C.I. and/or A.D.**, up to 20 years before [7]

## Using what?



Sleep [8-11]
Heart [12-14]
Physical activity [9, 15-20]
**Digital Biomarkers**
Context
Social interaction
etc.

Memory [24-25, 30]
Depression [12, 21-23]
Affect [12, 28]
Anxiety [12, 21-23]
**Validated Scales and Performance Tests**
Motor actions [12]
Stress [29]
Processing speed
etc.

Imaging
Risk assessment
**Clinical Exams** (ground truth)
Medical analysis
etc.

## Future steps



For 3+ years

938+ cogn. normal participants fluent in English and/or French

Living in Geneva and surrounding areas

Using the mQoL [31] mobile application

Wearing a Withings Steel HR ® smartwatch

## Cooperating with

CAL CIGEV – COGNITIVE AGING LAB – CENTER FOR THE INTERDISCIPLINARY STUDY OF GERONTOLOGY AND VULNERABILITY

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Icons by Flaticon | © QoL Lab 2022

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