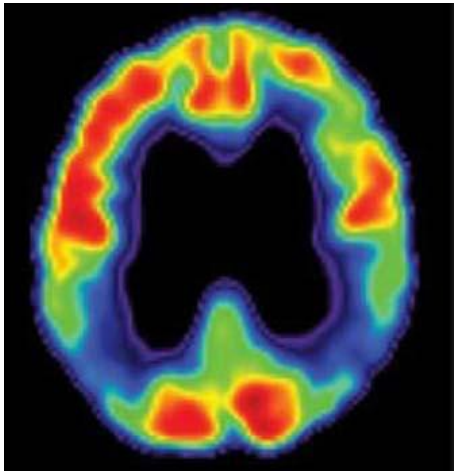
TÉCNICO LISBOA



Generation of Longitudinal MRI and PET Data in Patients with Alzheimer's Disease

2nd Cycle Integrator Project in Physics Engineering

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Motivation and problem

Alzheimer's Disease (AD):

➔ Progressive, **irreversible** neurodegenerative disease

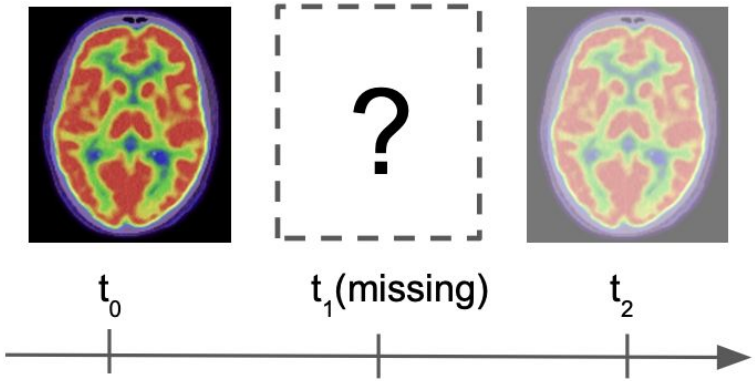
Why monitoring matters:

➔ **Early** detection and **better** clinical decisions

The problem:

➔ AI models **need** longitudinal data

➔ MRI and PET scans are often **missing**



Research gap

➔ Many models focus on **generating** the missing medical images.

➔ **Important** aspects are often overlooked:

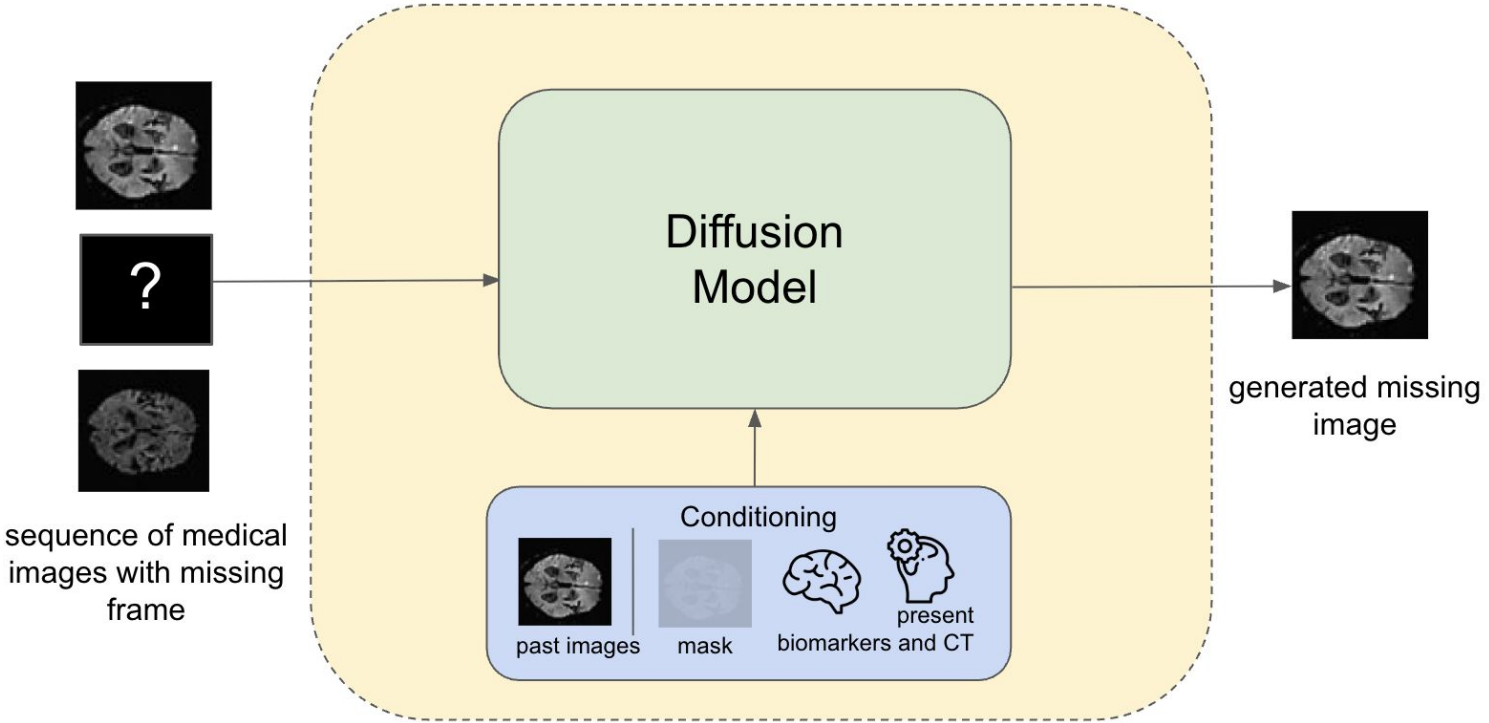
Clinical context

Clinical **information** (biomarkers and cognitive test (CT) scores) is often **available** at the **missing** time point

Biological plausibility

The images must **respect** the patient's **disease stage**, the expected **progression** of AD, and the patient's **anatomical structure**

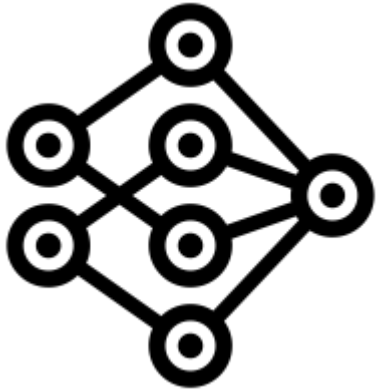
Thesis proposed architecture



What this work will enable

➔ **Better** disease progression modelling with more **complete** patient's records

➔ Potential usable **synthetic data** to train models



Thanks for your attention!