



**ARAMIS
LAB**
BRAIN DATA SCIENCE

November 16st, 2017

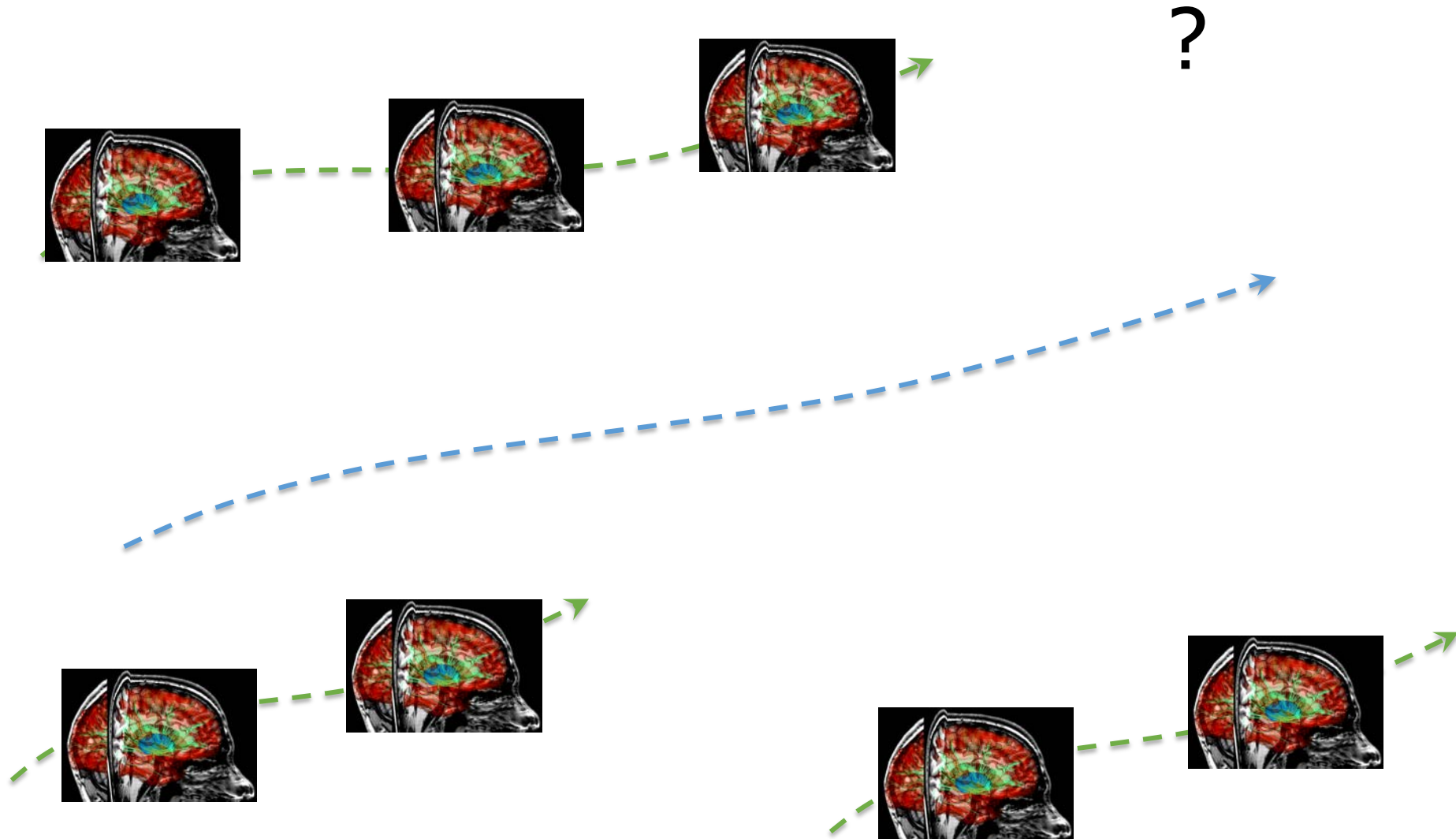
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@SDurreleman



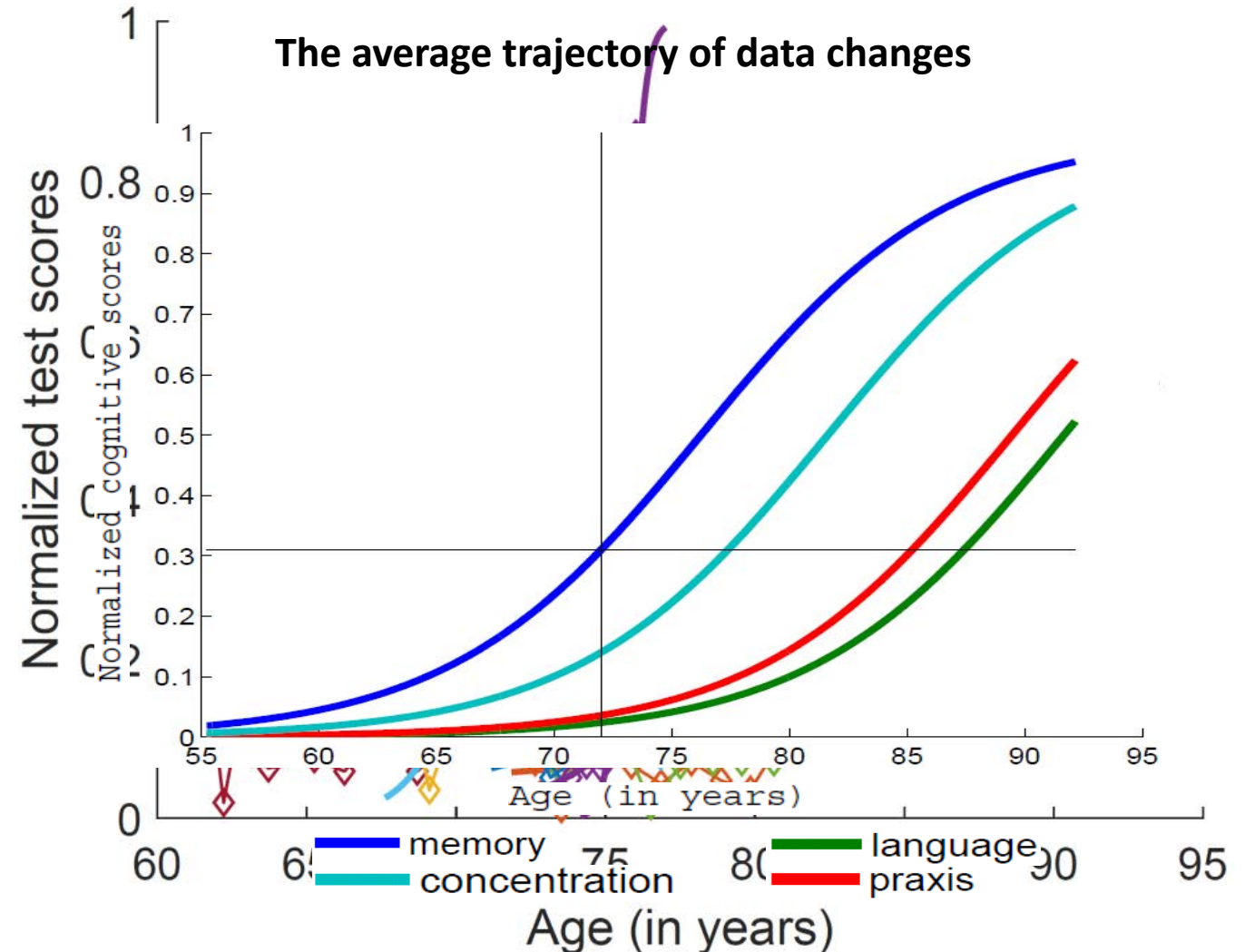
Quelle place pour l'intelligence artificielle dans la prise en charge de la maladie d'Alzheimer?

Stanley Durreleman



Model of cognitive decline in Alzheimer's Disease

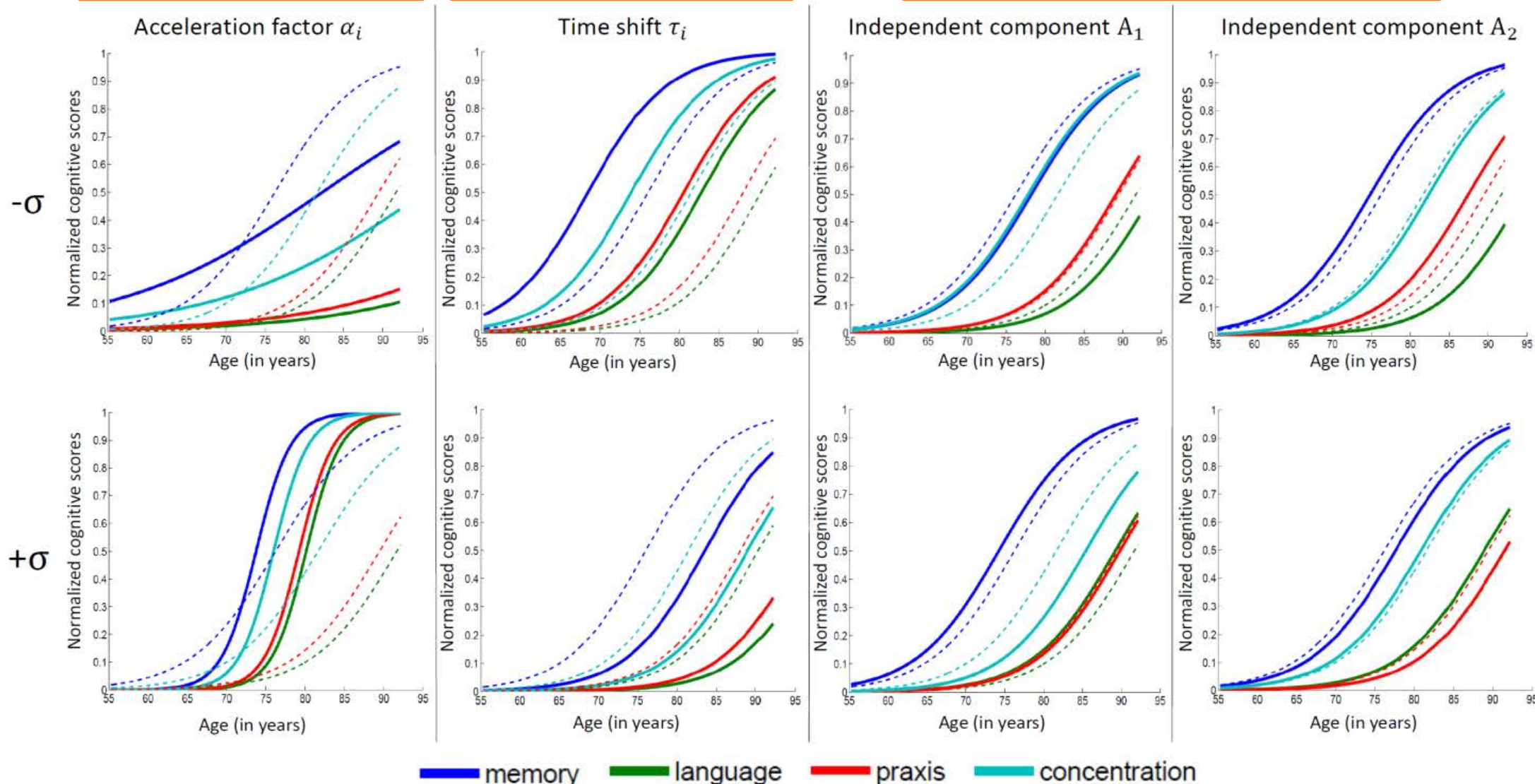
- Neuropsychological tests ADAS-Gog from ADNI
- 248 subjects who converted from MCI to AD
- 6 time-points per subjects on average (min 3, max 11)
- Data points $y_{ij} \in]0, 1[^4$ with propagation logistic model



Distinguish **fast** vs. **slow** progressers

Distinguish **early** vs. **late** onset individuals

Variability in the **relative timing** and **ordering** of the events



Automatic prognosis system (patent pending)

Parametres

alpha :1.00

tau:0.00

s1:0.00

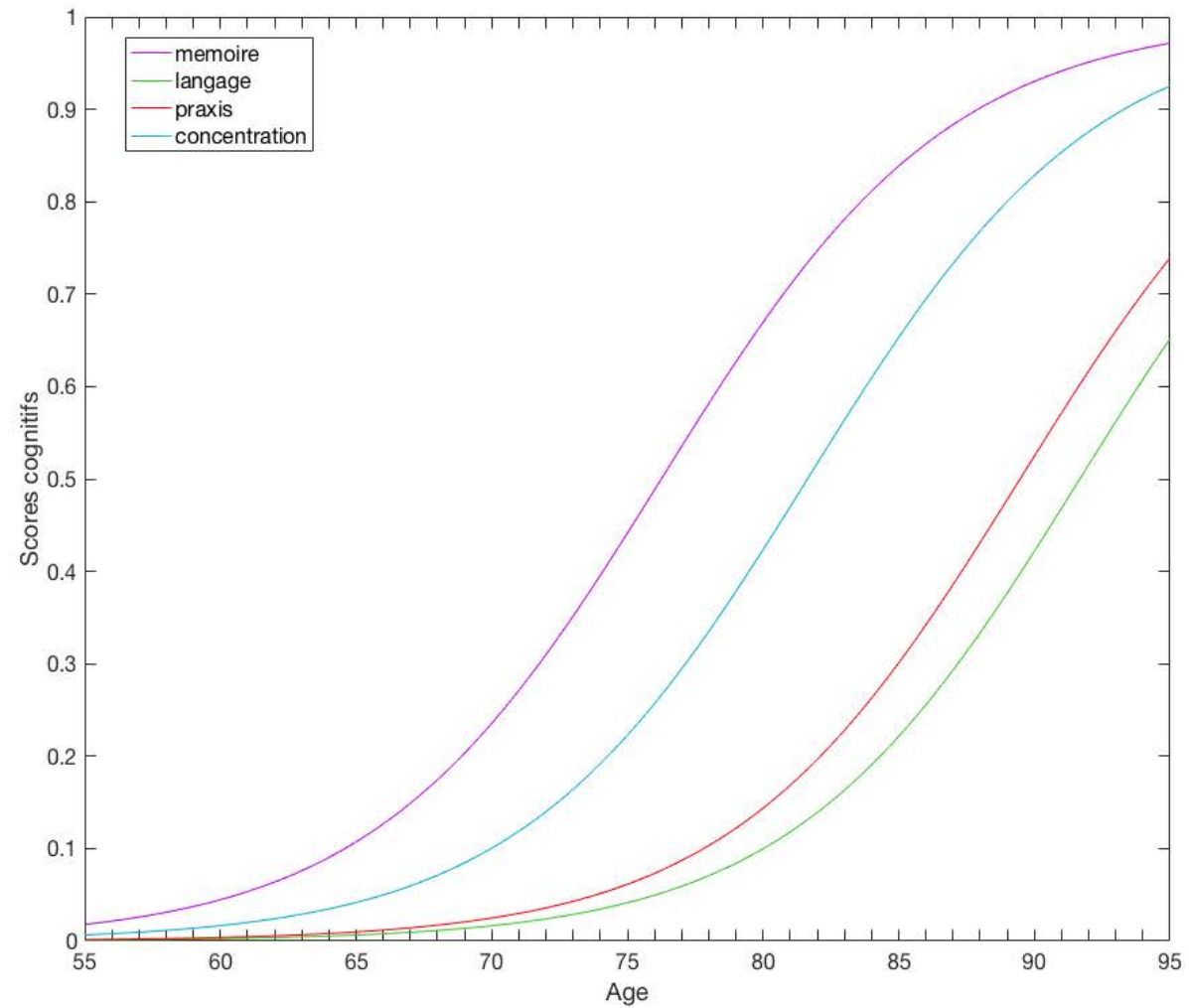
s2:0.00

Sujet

Numero sujet

Nombre de visites

Reset



Automatic prognosis system (patent pending)

Parametres

alpha :0.93

tau:3.51

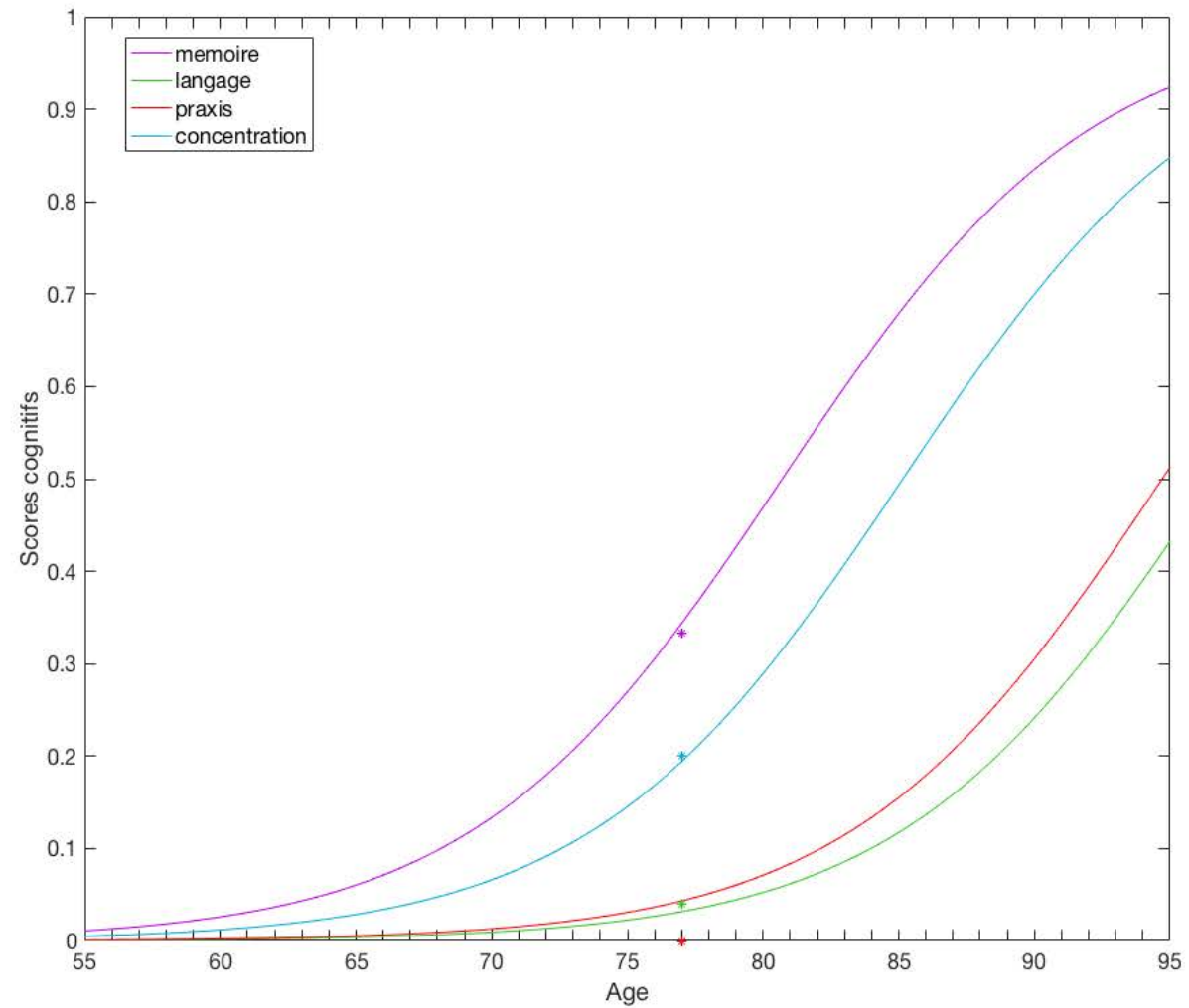
s1:-0.41

s2:0.49

Sujet

Numero sujet

Nombre de visites



Automatic prognosis system (patent pending)

Parametres

alpha :0.93

tau:3.51

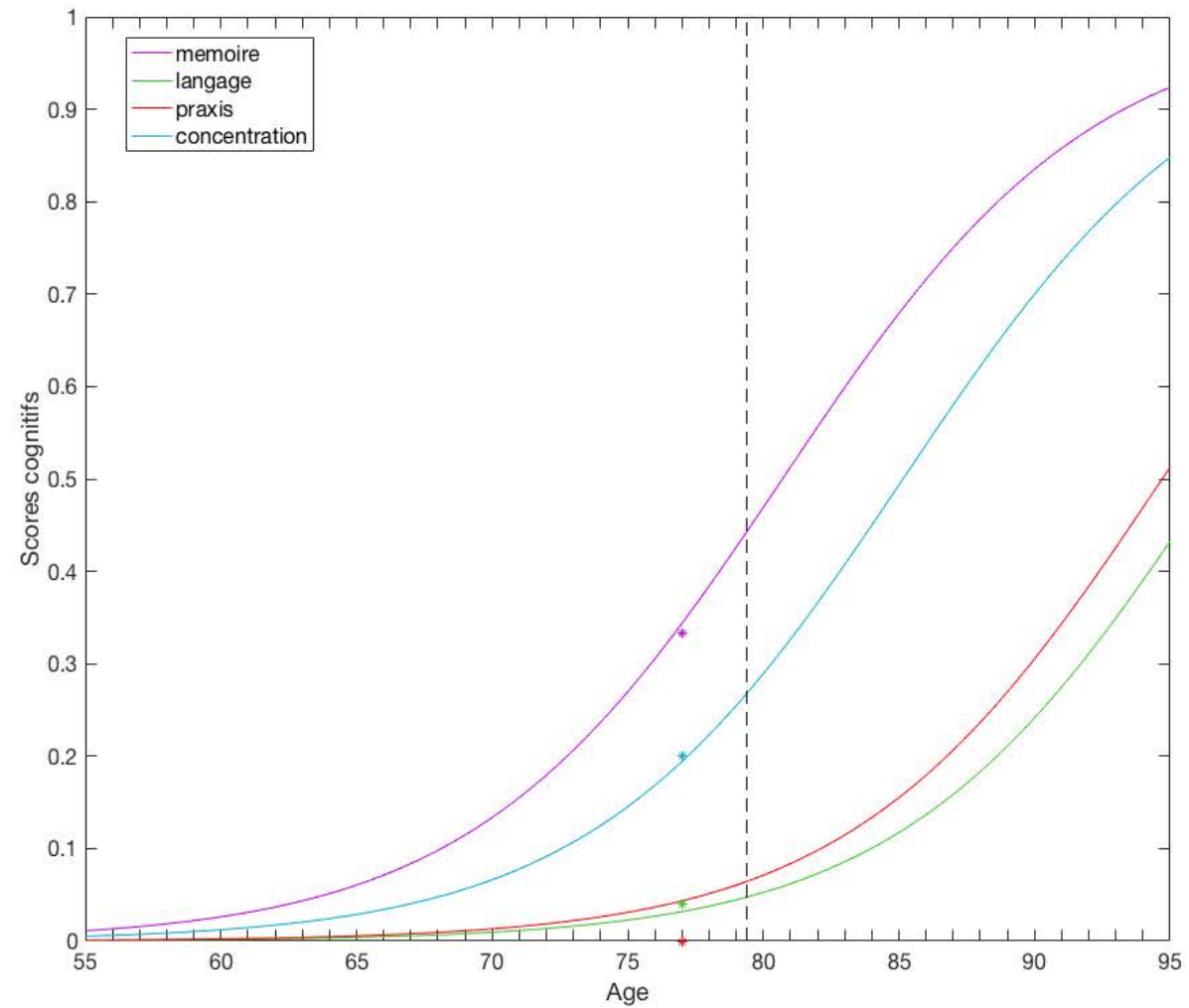
s1:-0.41

s2:0.49

Sujet

Numero sujet

Nombre de visites



Automatic prognosis system (patent pending)

Parametres

alpha :1.01

tau:3.07

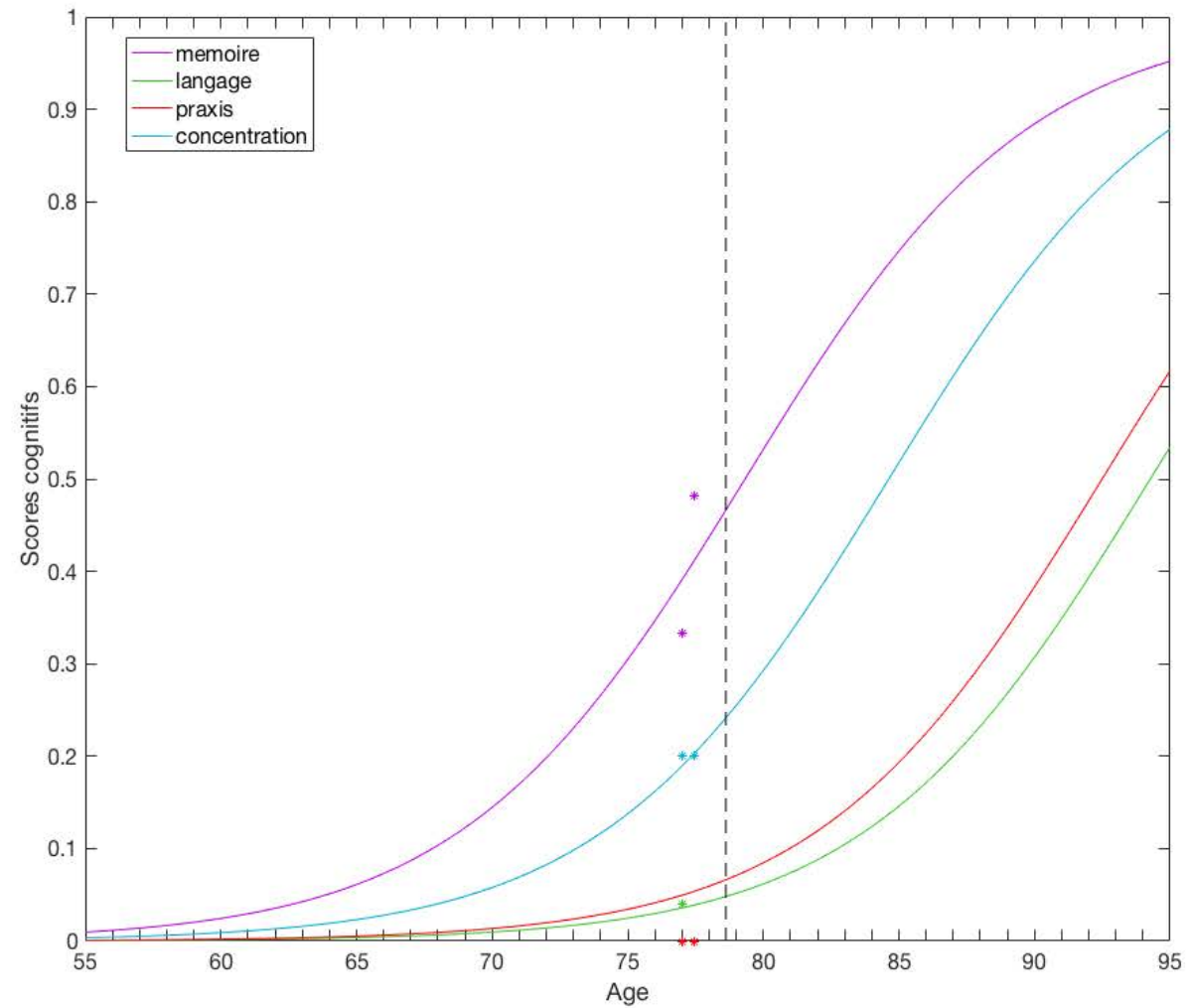
s1:0.06

s2:0.20

Sujet

Numero sujet

Nombre de visites



Automatic prognosis system (patent pending)

Parametres

alpha :1.08

tau:3.23

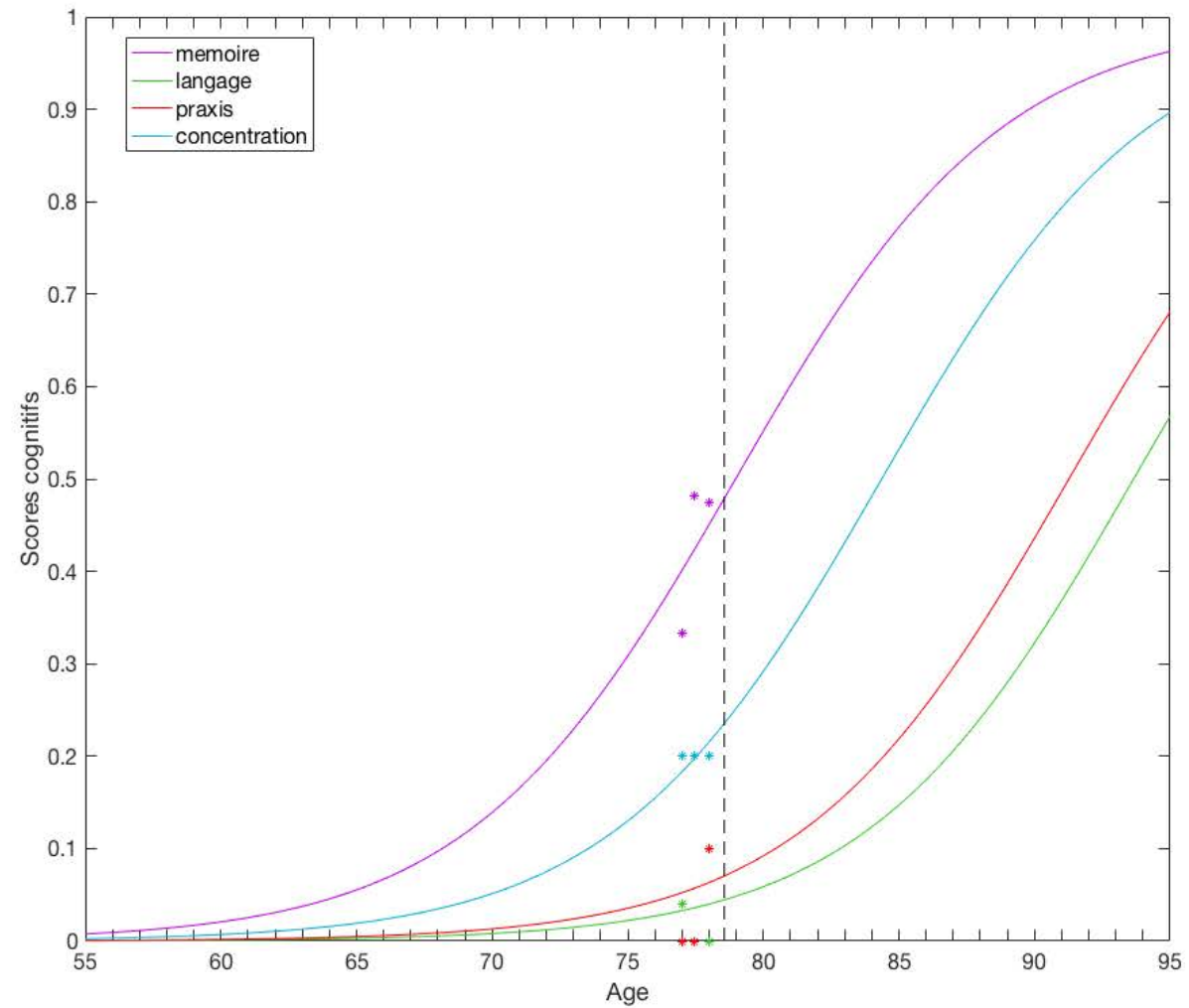
s1:0.10

s2:-0.26

Sujet

Numero sujet

Nombre de visites



Automatic prognosis system (patent pending)

Parametres

alpha :0.86

tau:2.97

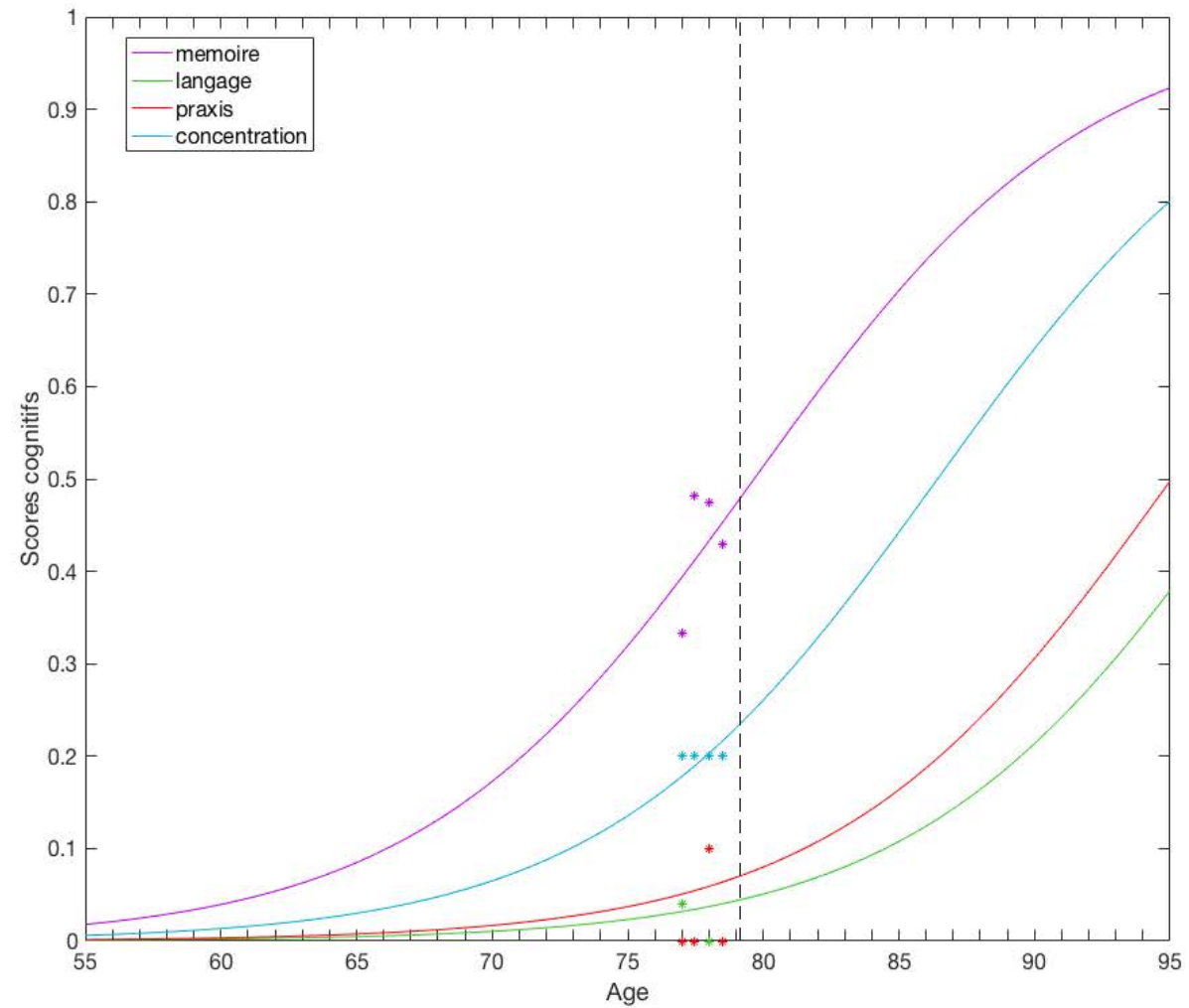
s1:0.11

s2:-0.26

Sujet

Numero sujet

Nombre de visites



Automatic prognosis system (patent pending)

Parametres

alpha :1.09

tau:3.62

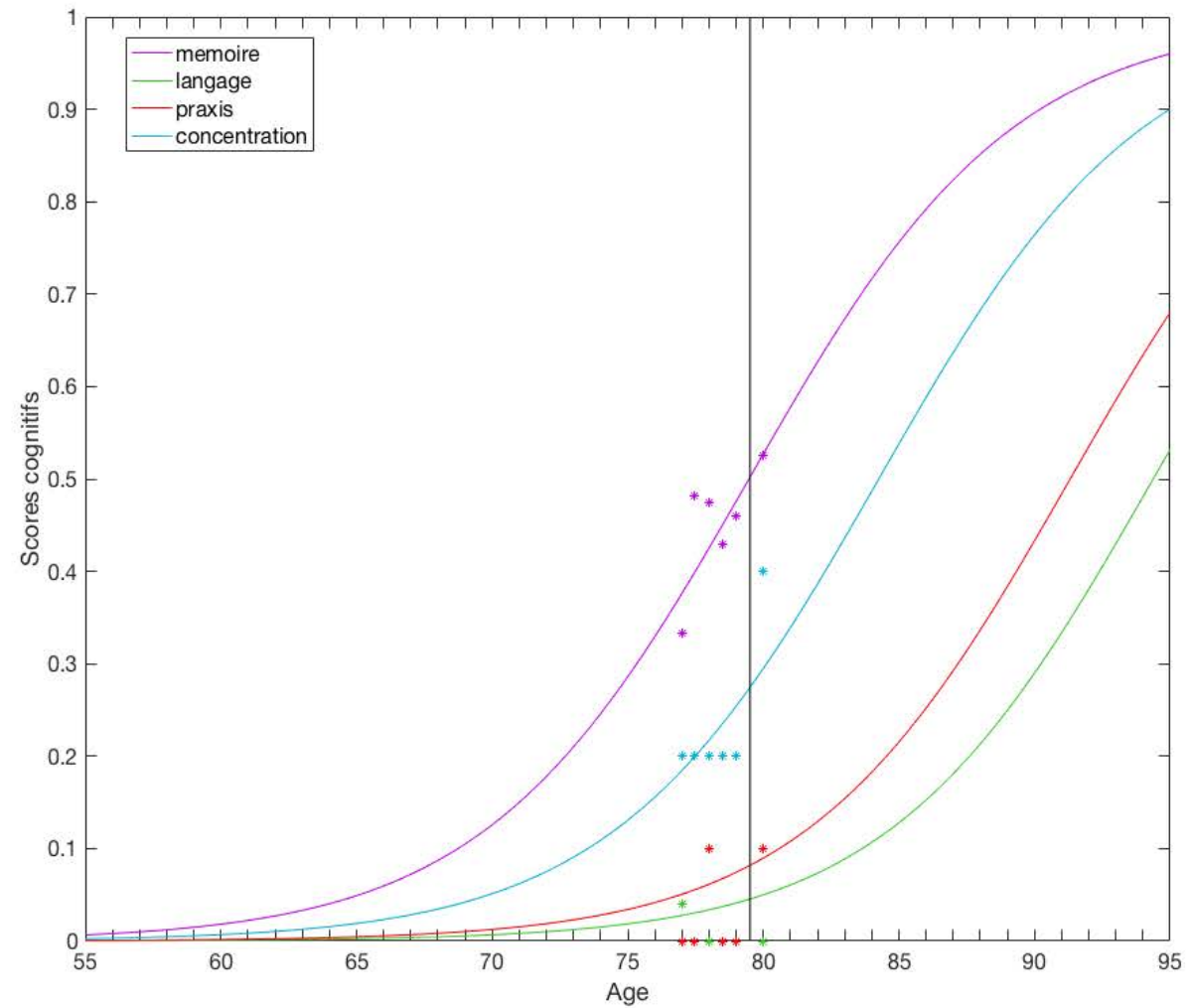
s1:-0.26

s2:-0.49

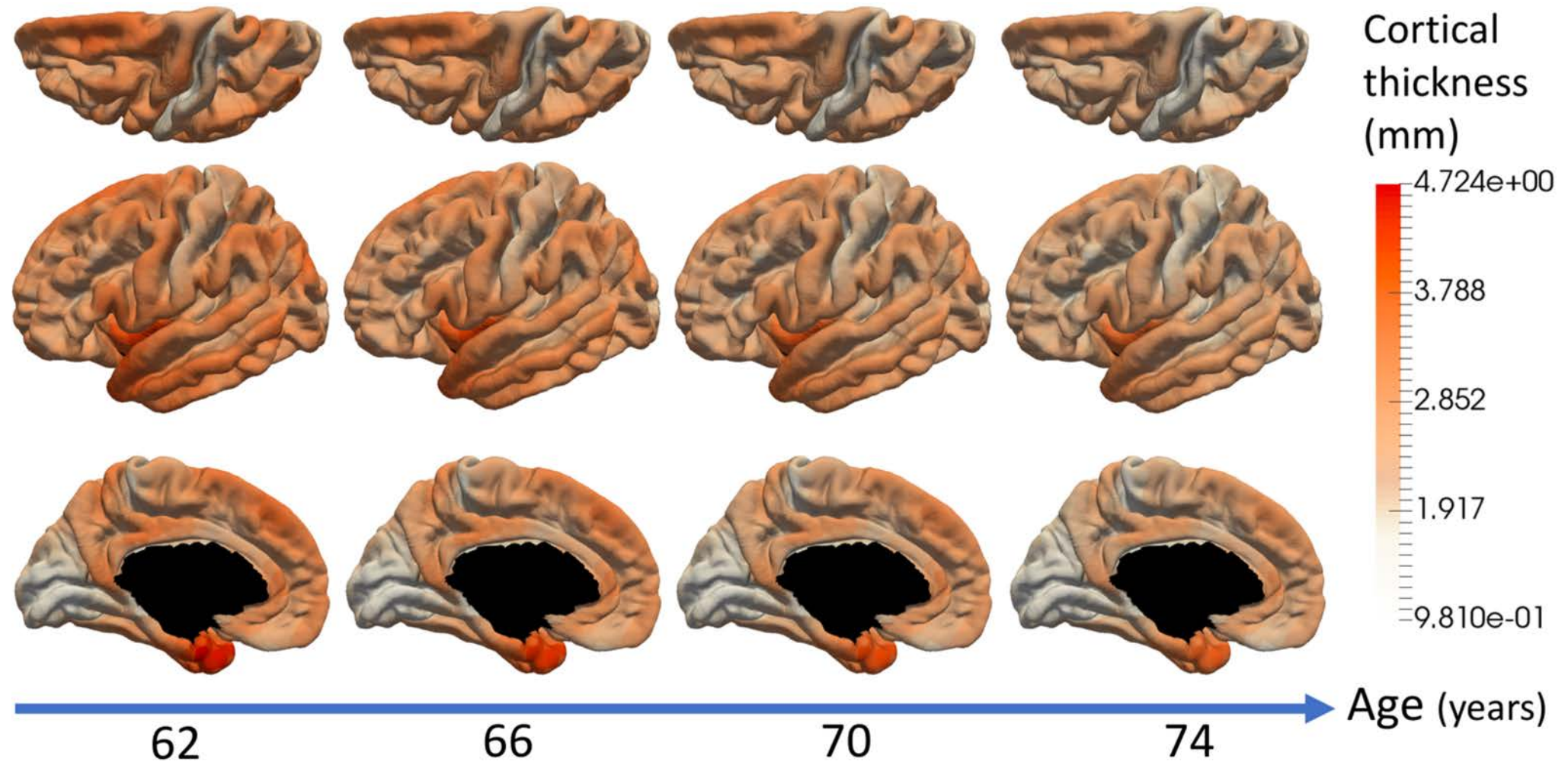
Sujet

Numero sujet

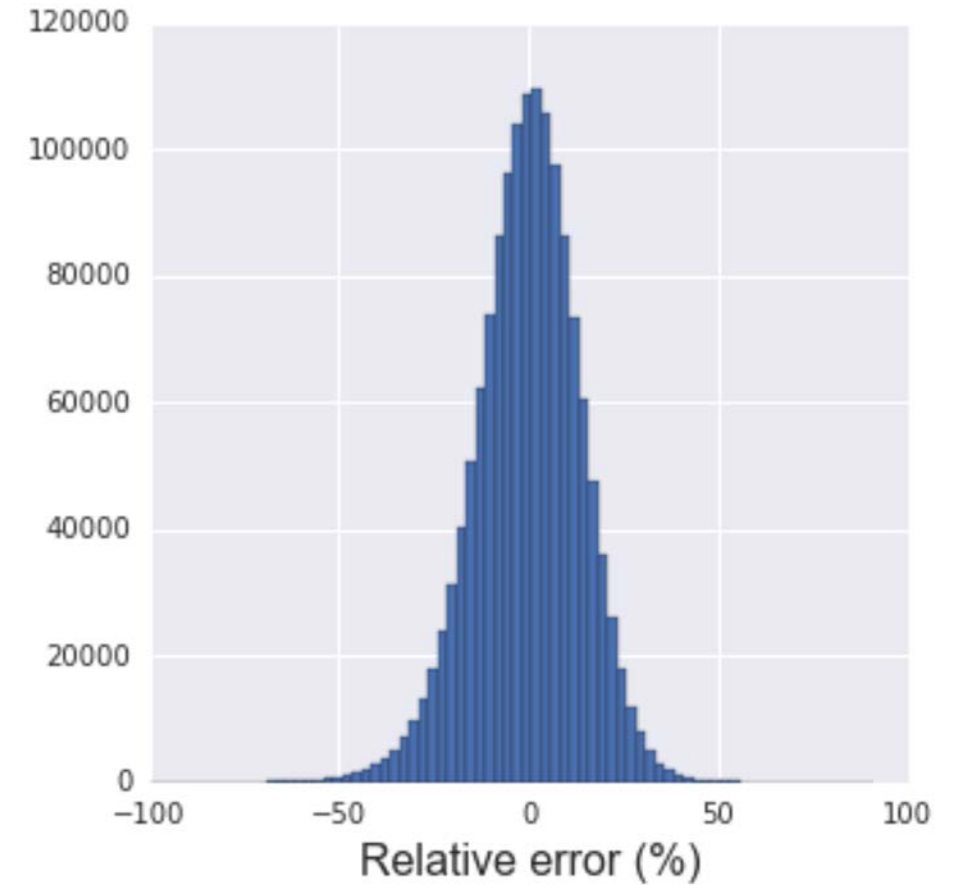
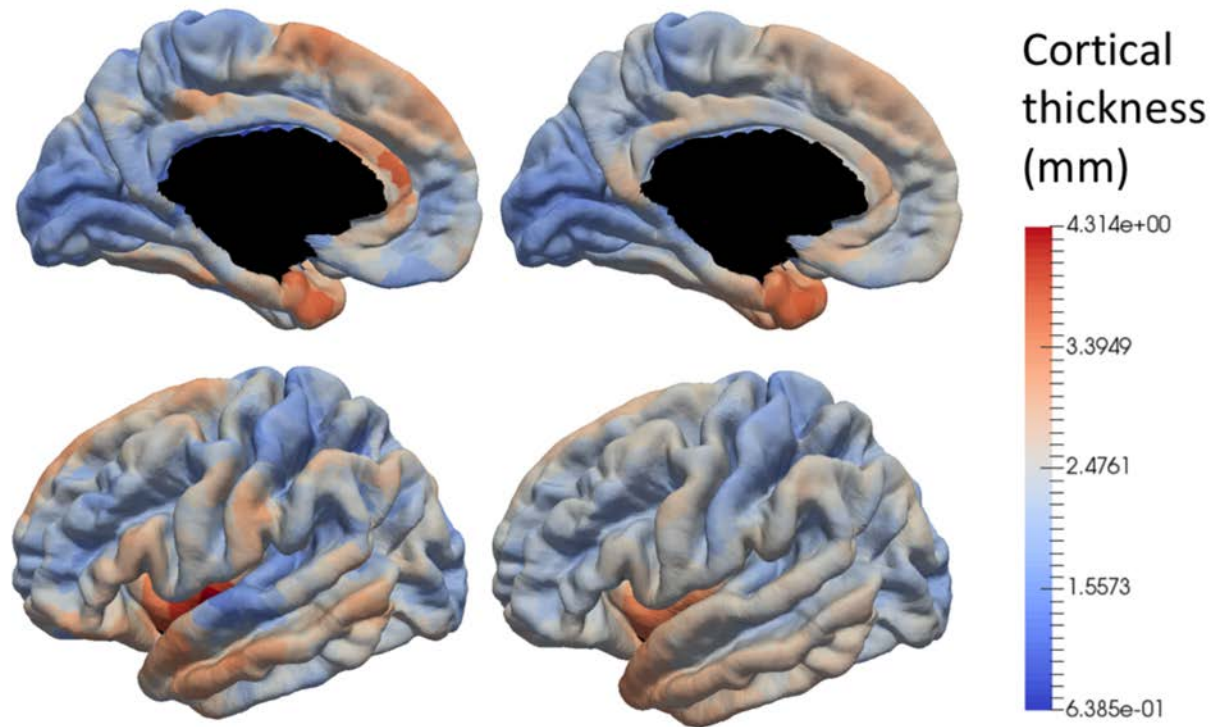
Nombre de visites



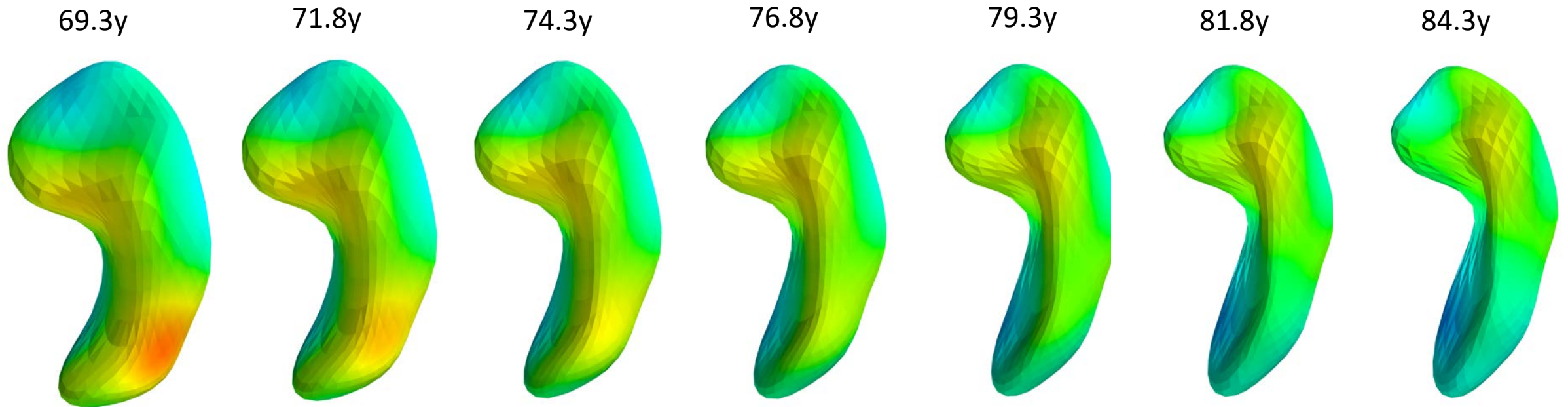
Model of cortical atrophy in Alzheimer's Disease



Reconstruction of individual observations by model personalization



Dynamical model of hippocampal atrophy in Alzheimer's Disease (20 MCI converters)





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Intelligence artificielle ?

A large, light gray, abstract graphic on the right side of the slide, consisting of thick, overlapping, curved lines that form a complex, organic shape.



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