EARLY DETECTION OF COGNITIVE IMPAIRMENT THROUGH GAMIFICATION, MACHINE LEARNING TECHNIQUES AND ICT TOOLS

Sonia Mª Valladares Rodríguez - PhD student[1]
Luis Anido Rifón - PhD, Full Professor[1], J. Manuel Fernández Iglesias - PhD, Associate Professor[1]
[1]School of Telecommunications Engineering, University of Vigo (Vigo - Spain), soniavr@det.uvigo.es

Universida de Vigo

1. MOTIVATION OF THE WORK

Cognitive assessment of early risk of AD:
- Episodic memory and executive functions [1]

Target users: > 55 years old people

Limitations of classical cognitive tests [2,3]:
- Health professionals are required
- Late detection
- Confounding factors
- Intrusive

Challenge -> new tools:
- Easy to administer
- Cost-effective
- Independent of learning effect [4]
- Non intrusive
- Ecological validity [5]

New approach -> Videogame Test

2. THESIS OBJECTIVES

Main goal:
"To design and develop a digital test in order to detect early cognitive impairment"

PANORAMIX

3. RESEARCH PLAN

Main issues:

- Participatory design and user centered
  - Focus group [Senior Uvigo & AFAGA]
  - Continuous feedback [David Facal—USC]
- Incremental development
- Cross-sectional & one-left-out methodology
- Ethical committee approval
- Machine Learning algorithm of prediction
- Psychometric properties, APA [6]

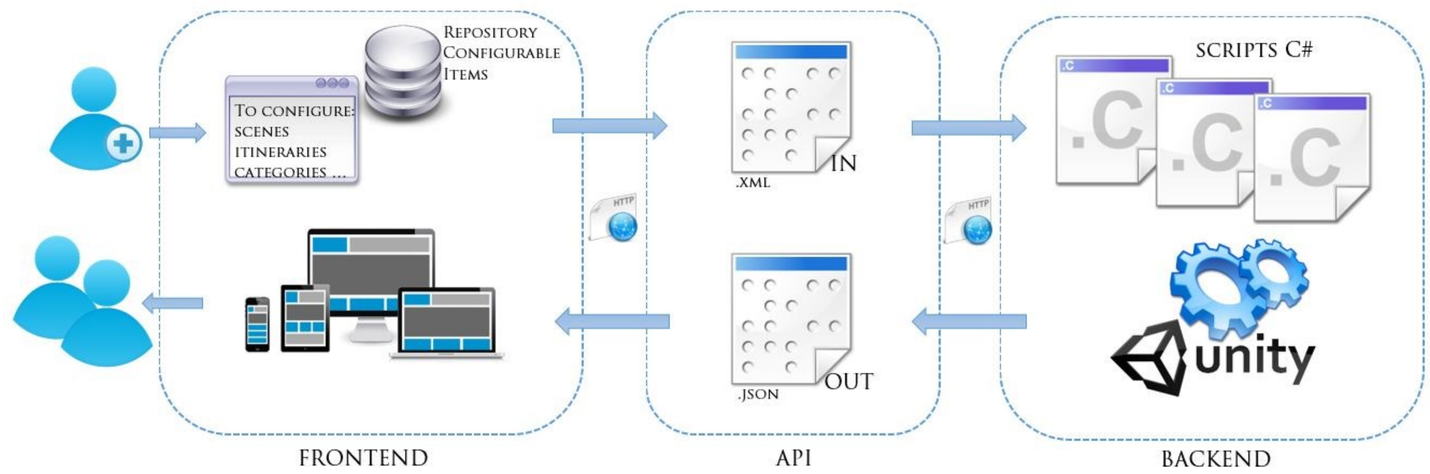
Current dissemination:

- JCR Article was sent to JBI (Q1): "Neuropsychological Assessment Using Serious Games: a Literature Review"
- Central core CONECTAPEME 2016
- Conference paper Informatics 2016
- Conference paper ICTAgeingWell 2015 [7]
- Technical reports to Government of Galicia. [8,9]

4. RESULTS & DISCUSSIONS

Main results: "Panoramix" http://panoramix.gist.det.uvigo.es/

- Episodic memory [California Verbal Learning Test]
- Attention [Simon Says game]
- Semantic memory [Pyramids and Palm Trees Task]
- Working memory [Corsi block-tapping Test]
- Procedural memory [Pursuit Rotor Task]
- Gnosis [visual gnosis tasks]



5. CURRENT YEAR PLANNING

Time	Task
June 2016	1º Pilot experiment [population: 5 HC, 5 MCI & 6 initial AD] AFAGA and Xunta de Galicia.
June 2016	Focus group with neuropsychologist USC & Grupo Traballo Demencias FAGAL
Jul 2016	Report results 1º pilot and focus group in two JCR articles
Jul-Sept 2016	Improvement phase of Panoramix
Oct 2016	2º Pilot experiment [N > 100] AFAGA and Xunta de Galicia
Dec 2016	Defence of Doctoral Thesis

6. REFERENCES

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