Playing with your Home Gym

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CONTEXT

The population in many countries, including Portugal, is ageing. Also, there is a decrease of human resources in healthcare. It is essential to invest in prevention, creating conditions for older adults to stay longer in their homes and remain active.

The traditional approaches to handle healthcare and assisting older adults are in their limits and new approaches are needed. It is essential investing in prevention, creating conditions for older adults to stay longer in their homes and remain active. Technology-mediated health monitoring and remote solutions for caregivers and health professionals support have great potential. It is necessary to create ways to motivate the elderly to stay active, giving them rewards for their effort. To serve as a proof-of-concept for this new paradigm, in partnership with OLI company, Rovisco Pais Rehabilitation Center, and University of Aveiro are implementing novel solutions for an older adult smart home. One of the solutions conceptualized is an exercise space for the house supporting tutoring, exercise monitoring, and creation of a virtual collaborative gym, rewarding them for their efforts.
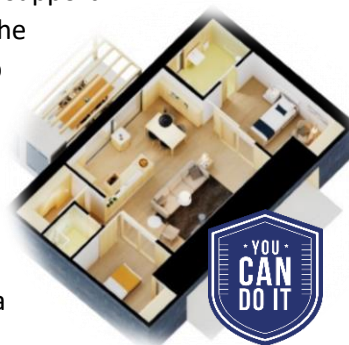
OBJECTIVES

This proposal aims at developing a prototype of the house exercises' zone - a kind of Gamified Home Gym - connected to other Homes.
The initial requirements for the system/solution are:
- Provide information regarding the exercise plan and exercises to the user;
- Interaction at distance to control the system (using speech and gestures);
- Interconnection with other similar systems, including video transmission;
- Reward the user with badges and/or points to motivate them;
- Initial monitoring capabilities of exercises execution;
- Robust enough to be deployed in real house (in advanced stages of construction).

TENTIVE WORK PLAN

- Acquisition of knowledge regarding the state-of-the-art.
  - Gamification for elderly (Martinho, Carneiro, Corchado, & Marreiros, 2020)
- Getting acquainted with the existing proofs of concept for the home (Last year work of a Gym@Home).
- Definition of main requirements and system architecture.

- Selection of tool(s) for the development (Kong, Wang, & Nichol, 2021) (Perez-Soler, Juarez-Puerta, Guerra, & de Lara, 2021).
- Iterative development of the assistant and its main components.
- Agile evaluation (for each iteration of the gamified gym at home).
- Addition of integrated system evaluation capabilities.
- Demonstrations.
- Writing documentation and reports.

REFERENCES

Kong, X., Wang, G., & Nichol, A. (2021). *Conversational AI with Rasa.* Packt Publishing. https://learning.oreilly.com/library/view/conversational-ai-with/9781801077057/.

Martinho, D., Carneiro, J., Corchado, J. M., & Marreiros, G. (2020). A systematic review of gamification techniques applied to elderly care. *Artificial Intelligence Review - An International Science and Engineering Journal*, 4863–4901.

Perez-Soler, S., Juarez-Puerta, S., Guerra, E., & de Lara, J. (2021). Choosing a chatbot development tool. *IEEE Software, 38*(4), 94-103. doi: 10.1109/MS.2020.3030198

NUMBER OF STUDENTS

4 or 5

RELATION WITH PROJECTS

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