Functional Assessment using a Virtual Environment

https://neurodegenerationresearch.eu/survey/functional-assessment-using-a-virtual-environment/

Principal Investigators

ESCHMAN, AMY

Institution

PSYCHOLOGY SOFTWARE TOOLS, INC.

Contact information of lead PI
Country

USA

Title of project or programme

Functional Assessment using a Virtual Environment

Source of funding information

NIH (NIA)

Total sum awarded (Euro)

€ 843,458.72

Start date of award

15/02/2015

Total duration of award in years

2

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Acquired Cognitive Impairment... Aging... Alzheimer's Disease... Alzheimer's Disease including Alzheimer's Disease Related Dementias (AD/ADRD)... Behavioral and Social Science... Brain Disorders... Clinical Research... Clinical Research - Extramural... Dementia... Networking and Information Technology R&D... Neurodegenerative... Neurosciences... Physical Rehabilitation... Rehabilitation

Research Abstract

This Phase II project will develop a computer-based tool for the functional assessment of higher level instrumental activities of daily living (IADLs) using simulated activities in a virtual environment (VE). IADLs are the high level activities such as managing finances and complex medication regimens and successfully negotiating novel or new situations that are necessary for fully independent living and which can be compromised by cognitive impairment in older individuals. The ability to conduct routine ADLs on a daily basis is the key element of successful aging. It is frequently the basis for determining whether an older individual is able to live independently and is a core criterion for the diagnosis of dementia. However, valid and reliable measurement of IADLs is difficult. Many existing scales were designed for use with patients with known cognitive impairment and focus on basic activities that are not sensitive to the decline in higher level behaviors that begins well before a dementia diagnosis is made. Most are based on an informant's or the individual's own rating of their abilities. Such an approach has the problem that, for a variety of reasons, individuals and informants may over- or under-rate the person's skills. The range of possible scores is also often limited. Virtual reality using computer simulated environments is an obvious vehicle for the reliable assessment of a range of functional activities. The ultimate goal is to use virtual environment technology to develop a tool that will accurately measure performance across a range of high level functional tasks in older individuals with very mild dysfunction. The proposed tool, Functional Assessment using a Virtual Environment (FAVE), will offer five environments across a range of functional abilities. The FAVE tasks (Telephone Use, Medication Management, Finance Management, Household Activities and Transportation/Navigation) have been identified in the literature as activities that are both crucial for independent living and susceptible to subtle impairment. In Phase I, we used a task analysis approach to prepare scripts and storyboards for each task/scenario, submitted them to a focus group of experts for review, and implemented two tasks plus an introductory task as virtual environment scenarios. Tasks were piloted with normal older individuals and individuals with mild cognitive impairment. Accuracy, response time, and eye-tracking data was collected and analyzed for differences between groups to determine the ability of FAVE to detect subtle difficulties in IADLs. Clear trends in speed and visual attention were identified. In Phase II, we will refine existing tasks, implement additional tasks, validate the tasks in an extensive study comparing FAVE results against actual performance in a large number of subjects, develop the most effective scoring metrics per task and overall, and perform usability/focus group testing to identify barriers to use and adoption. The resulting product will provide a tools to make functional assessment more feasible.

Lay Summary

Project Narrative Evaluation of performance in activities of daily living (ADLs) is essential in determining whether an older individual is able to live independently. ADL impairment is associated with many cognitive disorders of aging, and is a core criterion for diagnosis of mild cognitive impairment (MCI) and dementia, specifically Alzheimer’s Disease (AD). Therapeutic intervention that could delay placement of older individuals into long term case settings by a few years could significantly reduce Medicare costs by hundreds of billions of dollars, but existing tools for functional assessment are not sensitive enough to early signs of decline. We will provide an innovative performance-based measure of functional ability using a virtual environment targeting mild dysfunction across a range of high level functional tasks to address this unmet need, positively impacting the lives of millions of individuals and producing large economic benefits for society.

Further information available at:

Types:
Investments > €500k

Member States:
United States of America

Diseases:
Alzheimer's disease & other dementias

Years:
2016

Database Categories:
N/A

Database Tags:
N/A