Supervisor Project Idea

Supervisor

Insert a brief CV and/or external link, the total number of publications, the ORCID link, 5 of the most significant/recent publications, and a list of funded projects and awards. max 300 words

Prof. Maria Gabriella Ceravolo (female ♀, H-index = 39) . MD, PhD, Neurologist; Full Professor in Physical and Rehabilitation Medicine, https://orcid.org/0000-0002-2694-4638 (See Publication List at : http://prodapps.econ.univpm.it/iris/index.php?docente=MARIA%20GABRIELLA%20CERAVOLO&facolta=MEDICINA)
Head physician and Coordinator of the Neurorehabilitation Clinic, a rehabilitation facility based in the University Hospital of Ancona. The clinical and research activity focuses on the rehabilitation of people with acquired neurological disorders following brain injury or neurodegenerative diseases (Parkinson's disease, Multiple Sclerosis, Neuromuscular disorders). She is member of the European Academy of Rehabilitation Medicine, Chair of the Education Committee of the International Society of PRM, Coordinator of the Special Interest Scientific Committee on Rehabilitation in Parkinson's disease, within the European Society of PRM. She has authored around 160 publications, mainly focusing on the prognostic factors of functional (motor and cognitive) recovery and the effectiveness of rehabilitation intervention in people with acute brain injury or neurodegenerative disorders, with special attention to people with movement disorders. Principal investigator of several multicenter international clinical trials. Involved in several research projects, supported by
- European funds (**Horizon 2020 project "CAREGIVERSPRO-MMD", N 690211**; **Horizon 2020 project "MAGIC" PCP PHC-27 Call** on "Self-Management of Health & Disease & Patient Empowerment Supported by ICT"; **Erasmus+ project I-TRAIN** "Mobile Digital Training for Direct Care Workers dealing with Stroke Survivors" N. 2019-1-CY01-KA202-058338; **HORIZON-HLTH-2022-TOOL-12-01-t] project "PREPARE"** Personalized rehabilitation via novel AI patient stratification strategies,)
- or Italian funds (**AnzianAbili 3.0**, Bando Programmi Riabilitativi; **TREE-Tailored Rehabilitation for the Engagement and Empowerment of chronically disabled people**- bandi Fesr; **ASSECURE: A Sustainable Framework for cyber SECURITY in E-healthcare**: UNIVPM funded project; **RAPIDO – teleRehAbilitation for people with ParkInson's Disease at any mOment**, CARIVERONA funded project; Prot. 2020.0069 - ID 11656; **RICOMINCIARE RIabilitazione di pazienti COvid e loro Monitoraggio IN Casa con la pIattaforma ARcIntEllicare PG**/2020/362977) POR-FESR Emilia Romagna 2014/2020)

Research Group Description

Provide the name the reference department and a brief description of the research group, including external links, and available instrumentations and infrastructures. max 300 words

Department of Experimental and Clinical Medicine at Politecnica delle Marche University- Physical and Rehabilitation Medicine Sector
Staff
Marianna Capecci, Prof. PhD. (female, H-index = 22) Associate Professor of Physical and Rehabilitation Medicine,
http://prodapps.econ.univpm.it/iris/index.php?docente=MARIANNA%20CAPECCI&facolta=MEDICINA
Elisa Andrenelli, Md, PhD (female, H-index = 17) Assistant Professor of Physical and Rehabilitation Medicine,
http://prodapps.econ.univpm.it/iris/index.php?docente=ELISA%20ANDRENELLI&facolta=MEDICINA

STAFF SKILLS AND COMPETENCES
- Rehabilitation of people with Parkinson's disease through intensive aerobic approaches, cueing strategies, robots, action-observation- based treatments, tele-rehabilitation for dexterity, gait and speech disorders

- Invasive (DBS) and non-invasive brain stimulation (tDCS) for subjects with neurological diseases (movement disorders (Parkinson's disease and Dystonia), epilepsy, stroke)
- Dynamic electromyography examinations, analysis of three-dimensional movement computerized by optoelectronic systems (PocketEMG BTS-Italia, FreeEMG BTS-Italia, sis. ELITE - BTS-Italia)
- Movement analysis through the use of inertial accelerometer / gyroscope systems (smarphone-embeded or G-sensor BTS)
- Static and dynamic posturography exams (Satel system, Cosmogamma system, Kristler platforms)

The research group is based at the Neurorehabilitation Clinic , Ancona University Hospital, an inpatient and outpatient rehabilitation facility, equipped with a Laboratory for computerized movement analysis. The staff includes 6 Physical and Rehabilitation Medicine doctors, 16 physiotherapists, 4 speech therapists, 1 occupational therapist, 1 neuropsychologist and 16 resident doctors. PRM doctors and PTs are skilled in the use of wearable sensors for remote motor activity monitoring, and in the co-creation (with engineers) of web-platform for telerehabilitation delivery,
The Neurorehabilitation Clinic is a regional referral centre for the management of people experiencing chronic disability due to neurodegenerative diseases, as Parkinson's disease and dementias, and to cerebrovascular diseases
The whole staff is already well-trained in the assessment of functioning through the measures of independence in basal and instrumental activities of daily living, the quantification of motor and cognitive impairment and patient-reported outcome.

Title and goals

Provide the title of the topic and a short summary of the project idea. max 200 words

AN IMMERSIVE VIRTUAL REALITY INTERVENTION TO EXPAND THE ACCESS TO REHABILITATION FOR PEOPLE WITH NEUROLOGICAL DISABILITY – THE VIRTUS PROJECT

Non communicable disorders affect up to 2,3 billion people in the world, being the major cause of chronic disability and accounting for the 63% increase in the total amount of disability-adjusted life years after 1990 (https://vizhub.healthdata.org/rehabilitation/)
Chronically disabled people need regular appointments with Physical and Rehabilitation Medicine (PRM) physicians to check their health status and disability progression. Rehabilitation therapy has been identified as a suitable solution to fight functional decline and improve quality of life. Albeit training regularity and intensity are crucial factors to ensure effectiveness, performing training sessions at clinical centres is neither feasible nor economically sustainable for all those who are in need of rehabilitation.
Self-administered remotely supervised and personalized training at home is regarded as an alternative to delivering tailored rehabilitation interventions in the post-acute and/or the long-term phase, using digital telecommunication technologies. The combination of rehabilitation at home with tele-monitoring, allowing objective patient data collection continuously, in the real-world, can improve patient-clinician interactions and empower patients over their health.
We propose to test the feasibility, safety, and effectiveness of self-administered motor and cognitive training exploiting a commercial immersive virtual reality device in a large population of people with disabling noncommunicable disorders, either due to acute brain injury or neurodegenerative disease.

Contact details (*including email address of the supervisor*)

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