



UNIVERSITÀ
POLITECNICA
DELLE MARCHE

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

Prof. Maria Gabriella Ceravolo



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Supervisor: Prof. Maria Gabriella Ceravolo

Research Group Description: the Supervisor

Prof. Maria Gabriella Ceravolo, (female ♀, H-index = 39) . MD, PhD, <https://orcid.org/0000-0002-2694-4638>

Neurologist, **Full Professor in Physical and Rehabilitation Medicine**, DiSMC UNIVPM **Coordinator of the DiSMC section of Clinical Neurosciences Head physician and Coordinator of the Neurorehabilitation Clinic**, a rehabilitation facility based in the University Hospital of Marche – Ancona, Italy.

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.

More than 190 publications, focusing on 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. <https://orcid.org/0000-0002-2694-4638> ([Publication List](#), H-index = 39)

Principal investigator of several international multicentre clinical trials

Supervisor of national PhD students and post-doc Fellows with different educational backgrounds: MDs, Informatics Engineers, Speech therapists, Physiotherapists, Cognitive Neuroscientists

- European fundings:
 - [“CAREGIVERSPRO-MMD”](#) (H2020)
 - [“MAGIC” PCP PHC-27](#) Call on “Self-Management of Health & Disease & Patient Empowerment Supported by ICT” (H2020)
 - [Erasmus+ project I-TRAIN](#) “Mobile Digital Training for Direct Care Workers dealing with Stroke Survivors”
 - [“PREPARE”](#) Personalized rehabilitation via novel AI patient stratification strategies - HORIZON-HLTH-2022-TOOL-12-01-t
- National funding
 - TREE-Tailored Rehabilitation for the Engagement and Empowerment of chronically disabled people-bandì 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;



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University Hospital Neurorehabilitation Clinic

The Clinic is a European-level certified training center for postgraduate PRM (Physical and Rehabilitation Medicine) education (<https://uems-prm.eu/>) and is involved in training activities for medical students, PhD students, Physiotherapy and Speech therapy trainees

STAFF: Neurologists, Psychiatrists, Physiotherapists, Occupational therapists and Speech therapists, Information Engineer, with long-lasting experience in the diagnosis, clinical and instrumental assessment, medical and surgical treatment (Deep Brain Stimulation), and inpatient/outpatient rehabilitation

CLINICAL RESEARCH ACTIVITY

EMG and ECO-Guided BOTULIN TOXIN treatment for spasticity and movement disorders

Rehabilitation of people with acquired neurological, movement disorders, musculoskeletal disorders, oncologic derived disabilities



RESEARCH AND PUBLICATIONS

<https://orcid.org/0000-0002-2694-4638>

<https://orcid.org/0000-0002-1472-606X>

<https://orcid.org/0000-0001-7982-9871>

<https://orcid.org/0000-0003-1471-092X>



ACADEMIC STAFF (25): Professors (MED34) and researchers (MED34, ING/INF05), PhD Students, Trainers in Physical and rehabilitation Medicine (MD)



LABORATORY

Posture and Movement analysis and dynamic EMG



EQUIPMENT

Tele-rehab experimental platform

<https://www.rehab-univpm.it/public/#/home>



Non invasive Brain Stimulation

Dept. Exp & Clin Med – DiMSC UNIVPM
Clinical Neuroscience Section



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The Department of Experimental and Clinical Medicine DiMSC

The Department of Experimental and Clinical Medicine was established on the 1st July 2011, following a process of reorganisation of the University, from a merging of groups which came from the deactivated departments of Medical and Surgical Sciences, Neurosciences, Molecular Pathology and Innovative Therapies.

The Department is a self-managing organizational branch of the university which is dedicated to scientific research, teaching, and contributing to the so called Third Mission of the Higher Education Institution through the dissemination of scientific research findings amongst the community.

Its main aims are to plan, organize and regularly assess the quality of the research activity carried out in the scientific sectors and disciplines under its jurisdiction; to plan, organize and manage first level and master courses of the Faculty of Medicine and, last but not least, to provide cultural and educational activities and contribute to training and guidance activities according to the students needs in collaboration with the medical association.

<https://www.dimsc.univpm.it/>

AT A GLANCE

DIMSC



2024



168
Publications



42 Staff

Teaching programs for UNDERGRADUATES
(medical students (2 CLM), physioth.(2 CdL) and speech (2 CdL) ,
neuropsychiatr. (New) .h. trainees)
& POSTGRADUATE MEDICAL EDUCATION
(PhD – Human Health
Postgraduate school of specialization
Neurology, Psychiatry, Physical & Rehab Medicine, Neurosurgery,
General Surgery, Plastic surgery, Ophthalmology, Cardiosurgery)



Research
laboratories 5

>900.000 €
Research income



200 PhD, Post-doc,
Research fellows



Department of Excellence
(MIUR Art. 1, c. 314 – 337 L.
232/2016).

8 Clinical Research
Units





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Project Idea: AN IMMERSIVE VIRTUAL REALITY INTERVENTION TO EXPAND THE ACCESS TO REHABILITATION FOR PEOPLE WITH NEUROLOGICAL DISABILITY

Background: Rehabilitation is effective to promote health and prevent disability evolution at any age in any setting. It is not a service for the few!

(<https://vizhub.healthdata.org/rehabilitation/>), in fact it addresses the most of non communicable disorders that affect up to 2,3 billion people in the world, being the major cause of chronic disability. In order to ensure fair, widespread and sustainable access to rehabilitation services, telemedicine is emerging as an effective opportunity.

Project OBJECTIVE:

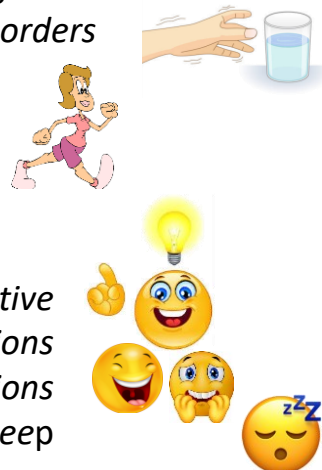
- to test the feasibility, safety and effectiveness of a home rehabilitation approach using a device for immersive virtual reality equipped with a library of serious games, co-designed by expert clinicians and engineers,
- exploiting commercial glasses for virtual reality (Relab-VR),
- in a large population of people with disabling non communicable disorders, due to acute brain injury or neurodegeneration.



MONITORING

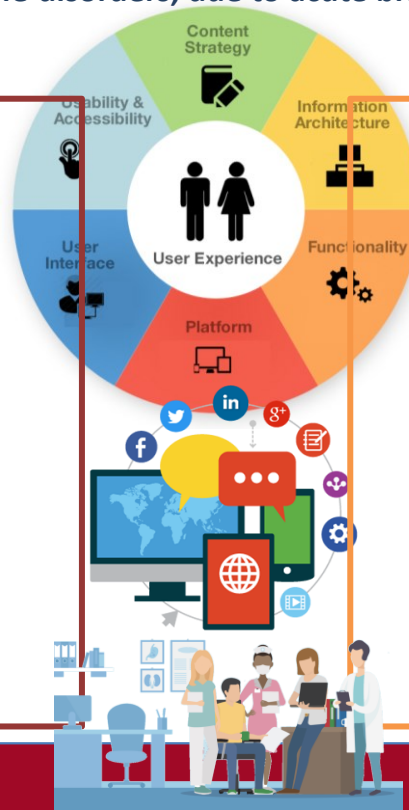
Motor function:

*Activity recognition
Movement disorders*



**Non Motor
function**

*Cognitive
functions
Emotions
Sleep*



REHABILITATION

Movement



Speech, Attention, Memory

