

# SARA FEDERICO

## RESEARCH PHYSIOTHERAPIST PHD CANDIDATE



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### CAREER OVERVIEW

Physiotherapist and neurorehabilitation researcher with extensive experience in tele-rehabilitation, virtual reality, and robotics for treating neurological conditions. Collaborated with industry on product development and evaluation. Neuroscience Ph.D. candidate dedicated to translating research into practical advancements for clinical practice.

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### EDUCATION

#### PhD Candidate in Neuroscience, Psychological and Psychiatric Science and Movement Science

University of Verona (Italy)| Sept. 2020 - Present

#### Advanced Course in Network Metanalysis

University of Milan (Italy)| Nov-Dec 2023

#### Evaluation and treatment of adults with neurological conditions- IBITA Basic Course

Venice (Italy)| May-Nov 2019

#### Advanced Course in Methodology of clinical research in health agencies

University of Modena (Italy)| May 2019

#### MSc in Rehabilitation Sciences of Health Professions

University of Verona (Italy)| Oct. 2016 - April 2019

#### BSc in Physiotherapy

University of Bari (Italy)| Nov. 2016

### EXPERIENCE

#### Research Physiotherapist

San Camillo IRCCS Hospital, Venice (Italy)|  
February 2018 - present

#### **Clinical experience as a Physiotherapist at the Neurorehabilitation Service**

- Assessment, rehabilitation of patients with severe brain injuries, spinal cord trauma, Multiple Sclerosis, Parkinson's disease, and neurodegenerative conditions.
- Administer specialized therapies to enhance motor skills and daily living functions.
- Collaborate with a diverse healthcare team for integrated patient care.
- Provide internal staff training on clinical assessments for neurological pathologies.

#### **Translational clinical research within the Healthcare Innovation Technology Laboratory**

- **Co-PI** project Finalised Research: "FINAGE" (GR-2018-12367927)
- **PI** project Current research "LIDO"
- Part of Pilot #3 of the HosmartAI **European Project** (grant agreement No. 101016834)
- **Data collection**- Finalised Research project "CALLIOPE" (Grant No. RF-2016-02363044)
- **Internal contact person** for the "Balance" project - (Grant No.: CC-2016-2365537\_BALANCE)
- **Data collection**- Finalized research project "COMBY", (Grant N. RF-2019-12371486)
- **Internal contact person for RIN**- (IRCCS Network of Neurosciences and Neurorehabilitation) for Telerehabilitation

## SKILLS

### **Technical and Medical Device**

- Expertise in utilizing advanced **Telerehabilitation** systems, (Khymeia ®)
- Proficiency in the application of surface **electromyography**.
- Expertise in working with Sensor Inertial Measurement Unit (**IMU**) technology for precise motion analysis.
- Extensive experience in operating **robotic** systems, including AMADEO® (Tyromotion), OAK®, PABLO®, DIEGO®, and OMEGO®.
- Adept at leveraging **virtual reality** systems, such as VRRS®, to enhance motor rehabilitation outcomes.

### **Automation and Control**

- Implemented and optimized **Co-Design** Room automation SMART technology in collaboration with Vimar S.p.a.(Italy), contributing to streamlined processes.
- Implemented and **Co-Design** a movement quality assessment app in collaboration with University of Thessaloniki (Greece).

### **Software proficiency**

- Highly skilled in **Microsoft Office** applications (Word, Excel, PowerPoint, Access) for data analysis, documentation, and presentation.
- Familiarity in statistical analysis software, particularly **RStudio**.
- Highly skilled with reference management software, including **EndNote**, for accurate citation and bibliography.
- Competent in **systematic review** tools like RevMan and CINA

### **Scientific writing and communication**

- Proven ability in crafting scientific documents, research papers, and reports.
- Effective communication of research findings and methodologies in a clear and concise manner.
- Detail-oriented in preparing manuscripts, adhering to academic standards and publication guidelines.
- Proficient in designing and presenting posters for scientific conferences.
- Experienced in delivering presentations at conferences to communicate research outcomes.
- Skilled in conducting lectures for students, providing comprehensive insights into relevant subjects.

### **General competencies**

- Strong management skills in coordinating and overseeing rehabilitation processes.
- Customization of interventions and care plans tailored to individual patient needs, ensuring optimal outcomes.

## EXPERIENCE

### **Visiting PhD Student**

University of Madeira, **NeuroRehabLab**, Madeira (Portugal)| April 2023 - June 2023

### **Outpatient Physiotherapist**

FEVOSS ONLUS, Verona (Italy)| Sept 2017- Jan 2018

- Outpatient activities of physiotherapy, counseling in neurological and orthopedic patients

### **Home care Physiotherapist**

OMNIA impresa sociale, Verona (Italy)| Jan 2017- Jan 2018

- Orthopedic, neurological, geriatric and cardiorespiratory rehabilitation.

## PROFESSIONAL MEMBERSHIPS

Registered with the Italian Order of Physiotherapists in the Province of Venice, Padua and Rovigo, license number 922

Ordinary member of **AIFI** - Italian Association of Physiotherapy.

- Operational member of the Special Interest Network (**NIS**) in **Digital Technologies**.
- Member of the Special Interest Group (**GIS**) in **Neurological Physiotherapy**.

Member of the Special interest Group (**SIG**) in **Tele-Neurorehabilitation of the WFNR** (World Federation for Neurorehabilitation)

Member of the Italian Association of Neurological Rehabilitation (**SIRN**).

## LANGUAGES

- **Italian:** Native proficiency
- **English:** Fluent (spoken and written)
- **Portuguese:** Basic

## ACADEMIC/PROFESSIONAL COMMITMENTS

Academic Years 2021/2022 2020/2021	Seminary Teacher: "Research Methodology" - Bachelor degree course in Physiotherapy - <b>University of Bari</b> - Brindisi educational center - 6 hours
2019-2023	<ul style="list-style-type: none"><li>• Co-supervisor in <b>Bachelor's degree theses in Physiotherapy</b> (University of <b>Padua</b>)</li><li>• Co-supervisor in the <b>First-level Master's Degree</b> thesis in <b>Neurorehabilitation, University of Rome-La Sapienza</b>: "Exergames in ambiente di realtà virtuale per il trattamento dei disturbi dell'equilibrio nella malattia di Parkinson: un case report"</li><li>• Thesis Supervisor in <b>Professional Master's programme in Neurological physiotherapy</b> (University of <b>Verona</b>): "Effetti della teleriabilitazione motoria sulla qualità di vita in soggetti con patologie neurologiche: una revisione sistematica"</li></ul>

## ORAL//POSTER PRESENTATIONS

### Invited Speaker

- **"THIRTEENTH CONFERENCE OF CLINICAL AND FORENSIC TRAUMATOLOGY - 20th Course of Orthopedics, Traumatology and Forensic Medicine"** - Salsomaggiore Terme (24/11/2023)
- **LIVE WEBINAR- SCUOLA SIRN** (Italian Society of Neurorehabilitation): "La Teleriabilitazione in Neuroriabilitazione: tra esperienze attuali e prospettive future". On-line, 13-14 June 2023
- **"TWELFTH CONFERENCE OF CLINICAL AND FORENSIC TRAUMATOLOGY - 19th Course of Orthopedics, Traumatology and Forensic Medicine"** - Salsomaggiore Terme (04/11/2022)
- **"INTERNATIONAL SCIENTIFIC CONGRESS AIFI-Physiotherapy and Proximity"** - Palermo (28-29/10/2022)
- **First International Conference on Teleneurorehabilitation**-An Integrated Telerehabilitation System: preliminary results of a neuromotor teletreatment in people with a stroke" - Crotone (Italy) (10-11 May 2019)

### Poster/Oral Presentation

- "Effects of an integrated telerehabilitation model for post-stroke continuity of care: a multicentre feasibility study" - **World Physiotherapy Congress 2023**, Dubai, UAE (2-4 June 2023)

### Guest Lectures

- "Telerehabilitation in clinical practice: the clinical perspective" - during the course of E-health (fourth grade of M.Sc of the ICT for Internet and Multimedia, curriculum ICT for Life and Health), **Department of Information Engineering of the University of Padua** (Italy) (10/01/19;07/01/19; 24/05/21)

### Poster Sessions

- "Sistema Intelligenza Artificiale nell'Integrazione di Sensori Domotici e Dispositivi Riabilitativi: Dati Preliminari da uno Studio Longitudinale Pilota (HoSmartAI) per il Recupero Neuromotorio" - Presented at the **SIRN National Congress**, Florence, Italy (February 15-17, 2024)
- "Teleriabilitazione nel paziente neurologico adulto: nuove prospettive nella riabilitazione motoria"-Congresso - **National congress of telemedicine, telemonitoring and telerehabilitation(AITIM)**, Rome, Italy (24-25 November 2023)

- Development of a new advanced-technological neurorehabilitation model: patient satisfaction and functional recovery monitoring in neurological patients. Preliminary results of a pilot longitudinal study- **AIFI International Scientific Congress: "Tailored Physiotherapy"**, Bologna, Italy (November 10-11 2023)
- "Balance Board or Motion Capture? A Meta-Analysis Exploring the Effectiveness of Commercially Available Virtual Reality Exergaming in Enhancing Balance and Functional Mobility Among the Elderly"**AIFI International Scientific Congress: "Tailored Physiotherapy"**, Bologna, Italy (November 10-11 2023)
- "TeleSM: Uno Studio Randomizzato Controllato Multicentrico per Valutare l'Efficacia di un Trattamento Multidominio con Realtà Virtuale Semi-Immersiva in Telerabilitazione Combinato con tDCS" - Presented at the **SIRN National Congress**, Riva del Garda, Italy (April 16-18, 2023)
- "I Correlati Neurali tra Linguaggio e Gesto: Revisione Sistematica con Meta-Analisi di Studi di Risonanza Magnetica Funzionale" - Presented at the 21st **SIRN National Congress**, Naples, Italy (June 12-14, 2022)
- Development of an Integrated Telerehabilitation System for people with a Stroke in early home discharge" - **World Confederation for Physical Therapy Congress**, Geneva (Switzerland) (10-13 May 2019)
- "Simplifying chronicity: an integrated telerehabilitation system for people with a stroke. Preliminary results of a multicenter study" - XIX **National SIRN** (Italian Society of Neurological Rehabilitation) Congress, Perugia (Italy) (4-6 April 2019)

## PUBLICATIONS

- **Federico, S.**; Cacciante, L.; Cieřlik, B.; Turolla, A.; Agostini, M.; Kiper, P.; Picelli, A., on behalf of the RIN\_TR\_Group. Telerehabilitation for Neurological Motor Impairment: A Systematic Review and Meta-Analysis on Quality of Life, Satisfaction, and Acceptance in Stroke, Multiple Sclerosis, and Parkinson's Disease. *J. Clin. Med.* 2024, 13, 299. <https://doi.org/10.3390/jcm13010299>
- Kiper, P.; Godart, N.; Cavalier, M.; Berard, C.; Cieřlik, B.; **Federico, S.**; Kiper, A.; Pellicciari, L.; Meroni, R. Effects of Immersive Virtual Reality on Upper-Extremity Stroke Rehabilitation: A Systematic Review with Meta-Analysis. *J. Clin. Med.* 2024, 13, 146. <https://doi.org/10.3390/jcm13010146>
- Favetta M, Romano A, Valè N, Cieslik B, **Federico S**, Girolami A, Mazzarotto D, Pregnolato G, Righetti A, Salvalaggio S, Castelli E, Smania N, Bargellesi S, Kiper P and Petrarca M (2023) A scoping review of scientific concepts concerning motor recovery after stroke as employed in clinical trials. *Front. Neurol.* 14:1221656. doi: 10.3389/fneur.2023.1221656
- **Federico, S.**; Cacciante, L.; De Icco, R.; Gatti, R.; Jonsdottir, J.; Pagliari, C.; Franceschini, M.; Goffredo, M.; Cioeta, M.; Calabrò, R.S.; et al. Telerehabilitation for Stroke: A Personalized Multi-Domain Approach in a Pilot Study. *J. Pers. Med.* 2023, 13, 1692. <https://doi.org/10.3390/jpm13121692>
- Cacciante L, Pregnolato G, Salvalaggio S, **Federico S**, Kiper P, Smania N, Turolla A. Language and gesture neural correlates: A meta-analysis of functional magnetic resonance imaging studies. *Int J Lang Commun Disord.* 2023 Nov 16. doi: 10.1111/1460-6984.12987. Epub ahead of print. PMID: 37971416.
- Enrichi, C.; Regazzetti, M.; Cieřlik, B.; Zanetti, C.; D'Imperio, D.; Compagno, E.; Cacciante, L.; **Federico, S.**; Pregnolato, G.; Zitti, M.; et al. How Lung Volume Recruitment Maneuvers Enhance Respiratory Function in Multiple Sclerosis Patients: A Quasi-Randomized Pilot Study. *Medicina* 2023, 59, 1896. <https://doi.org/10.3390/medicina59111896>
- Goffredo, M., Baglio, F., DE Icco, R., Proietti, S., Maggioni, G., Turolla, A., Pournajaf, S., Jonsdottir, J., Zeni, F., **Federico, S.**, Cacciante, L., Cioeta, M., Tassorelli, C., Franceschini, M., Calabrò, R. S., & RIN\_TR\_Group (2023). Efficacy of non-immersive virtual reality-based telerehabilitation on postural stability in Parkinson's disease: a multicenter randomized controlled trial. *European journal of physical and rehabilitation medicine*, 10.23736/S1973-9087.23.07954-6. Advance online publication.
- Goffredo M, Pagliari C, Turolla A, Tassorelli C, Di Tella S, **Federico S**, Pournajaf S, Jonsdottir J, De Icco R, Pellicciari L, Calabrò RS, Baglio F, Franceschini M; RIN\_TR\_Group. Non-Immersive Virtual Reality Telerehabilitation System Improves Postural Balance in People with Chronic Neurological Diseases. *J Clin Med.* 2023 Apr 28;12(9):3178. doi: 10.3390/jcm12093178. PMID: 37176618; PMCID: PMC10179507.

- Cacciante L, Turolla A, Pregnolato G, **Federico S**, Baldan F, Rutkowska A, Rutkowski S. The use of respiratory muscle training in patients with pulmonary dysfunction, internal diseases or central nervous system disorders: a systematic review with meta-analysis. Qual Life Res. 2022 Apr 23:1–26. doi: 10.1007/s11136-022-03133-y. Epub ahead of print. PMID: 35460472; PMCID: PMC9034447.
- Pagliari C, Di Tella S, Jonsdottir J, Mendozzi L, Rovaris M, De Icco R, Milanesi T, **Federico S**, Agostini M, Goffredo M, Pellicciari L, Franceschini M, Cimino V, Bramanti P, Baglio F. Effects of home-based virtual reality telerehabilitation system in people with multiple sclerosis: A randomized controlled trial. J Telemed Telecare. 2021 Dec 1:1357633X211054839. doi: 10.1177/1357633X211054839. PMID: 34851211.
- Cacciante L, Kiper P, Garzon M, Baldan F, **Federico S**, Turolla A, Agostini M. Telerehabilitation for people with aphasia: A systematic review and meta-analysis. J Commun Disord. 2021 Jul-Aug;92:106111. doi: 10.1016/j.jcomdis.2021.106111. Epub 2021 May 13. PMID:34052617.
- Cieslik B, Serveta A, **Federico S**, Szczepańska-Gieracha J. Altered postural stability in elderly women following a single session of head-mounted display virtual reality. Acta Bioeng Biomech. 2021;23(1):107-111.PMID:34846028.

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Venezia, 07/03/24

