

CARE: Empathic robotics for therapy and monitoring

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Social robotics, artificial intelligence, and biomedical sensors, both wearable and otherwise, can now converge into a single ecosystem to support clinical frailty. CARE (*Companion for Aging with Resilience and Evaluation*), developed by PROTOM in collaboration with Parthenope University, embodies this vision: a framework created for older adults with multimorbidity and frailty, but conceived from the outset as natively transferable to other vulnerable populations. CARE integrates clinical monitoring and

cognitive stimulation into a single relational platform.

A central element of the CARE system is PROBOT®, a social robot from the Italian company PROTOM ROBOTICS, capable of establishing an empathic relationship with the user, promoting trust, motivation, and overcoming technological barriers. In addition to continuous, non-invasive clinical monitoring of vital signs, PROBOT supports adherence to pharmacological therapies and cognitive rehabilitation programs, delivered in the form of interactive, playful, and therapeutic exercises. These exercises are personalized and characterized by adaptive complexity, with levels that automatically adjust based on the patient's progress or difficulties.

A distinctive feature of CARE is its digital clinical platform that integrates data from sensors and interactions with the robot. Doctors and caregivers have real-time access to an interface that documents physiological parameters, therapeutic progress, and cognitive training results, highlighting progress and critical issues and enabling timely and targeted interventions. In this way, CARE is a clinical-relational ecosystem, in which technology enhances the care delivery, reduces the caregiver burden, and strengthens the therapeutic alliance.

Thanks to its modular and adaptable architecture, CARE finds natural application beyond the geriatric field. In pediatrics, for example, children with chronic conditions or cognitive rehabilitation needs can benefit from an empathetic and motivating relational interface, capable of transforming therapeutic management into a more engaging experience that supports therapeutic continuity.

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