Press Release

21 September – World Alzheimer's Day

The Daisi&Ron project kicks off: robotics, AI, and virtual reality to support active aging for vulnerable seniors in nursing homes

The assistant robot TEO will be able to monitor, provide cognitive support and assistance, while easing the workload of caregivers.

- *The project, developed as part of the initiative Anthem – AdvaNced Technology for Human-centEred Medicine and funded by the Ministry of University and Research (MUR) under the National Complementary Plan (PNC) through a cascade call from the University of Milano-Bicocca, is coordinated by Prof. Alessandro Vercelli, Director of the Department of Neuroscience "Rita Levi Montalcini" and of NICO – Neuroscience Institute Cavalieri Ottolenghi at the University of Turin, with the contribution of Teoresi Group and Intravides Srl (a UniTo spin-off).*
- *The goal of the project is to test the use of robots in elderly care by monitoring cognitive levels (at home or in nursing facilities), helping to detect Alzheimer's and related conditions, and promoting active aging through exercises and cognitive activities. This will be achieved through the combined use of assistive robots, conversational AI for user–robot communication, and virtual reality.*
- *Teoresi Group is participating as a technology partner, contributing to the development and integration of AI and robotics technologies for the project, as well as to the programming of the assistive robot TEO, which is currently being tested at the Turin site. The robot is designed to move autonomously, interact with users, and simulate realistic use scenarios in preparation for its application in nursing homes.*

Daisi&Ron kicks off, the project that integrates **robotics**, **artificial intelligence**, and **virtual reality** to support active aging and the cognitive health of vulnerable seniors. Funded by the Ministry of University and Research (MUR) under the National Complementary Plan (PNC) through a cascade call from the University of Milano-Bicocca, and developed within the initiative ANTHEM – AdvaNced Technology for Human-centEred Medicine, the project is coordinated by the Department of Neuroscience "Rita Levi Montalcini" at the University of Turin, in collaboration with **Teoresi Group**, Intravides Srl (a UniTo spin-off), and NICO – Neuroscience Institute Cavalieri Ottolenghi. The goal of Daisi&Ron is to **monitor and stimulate the cognitive functions of older adults, both at home and in nursing facilities**, using advanced digital tools. The system combines assistive robots, conversational artificial intelligence for user–machine interaction, and immersive virtual reality environments—such as digital escape rooms—designed to enhance memory, attention, and orientation.

The **Department of Neuroscience "Rita Levi Montalcini" at the University of Turin** has been recognized as a Department of Excellence by the Ministry of University and Research (MUR) for the years 2017–2022 and again for 2023–2027. **It is a "vertical" department, encompassing basic, translational, and clinical research in neuroscience**. In its clinical laboratories (Neurology) and basic research facilities (Human Anatomy and the Neuroscience Institute Cavalieri Ottolenghi), the robot, after being assembled and programmed by Teoresi, will be tested in real-life living labs with elderly participants, before being presented to various stakeholders.

Teoresi Group is the **technology partner** of the project, contributing to the development and testing of robotic and AI solutions. Its work has focused on the overall system architecture, the integration of the virtual reality platform (developed by Intravides), and the programming of the assistive robot **TEO**[1], which is capable of moving autonomously, detecting obstacles, interacting through voice, and accompanying people along predefined routes. **Testing of TEO is currently underway at Teoresi's Turin headquarters**, with the goal of validating the robot's functionalities in realistic scenarios within controlled environments.

"*Our goal is to assess, under controlled conditions (the living labs), how well robots are accepted and used by elderly participants, healthcare professionals, and caregivers, in order to optimize levels of care, stimulate*

[1] Prodotto da OrionStar Robotics

the participants, and monitor their conditions and needs," adds **Prof. Alessandro Vercelli, Director of the Department of Neuroscience and NICO at the University of Turin**. *"In an aging society, with a continuously growing demand for care, it is essential to develop new solutions to support the national healthcare system and its professionals. It is also important to identify systems that can integrate with public healthcare, providing clinical and behavioral data for patient follow-up and personalized, including non-pharmacological, treatments. This approach will also allow for the processing and analysis of such data. While we cannot expect robots to replace caregivers, they can certainly complement and support staff, while also collecting valuable data to improve patient care and assistance."*

"With Daisi&Ron, we aim to demonstrate how technology can enable new forms of remote care, capable of improving the quality of life for vulnerable seniors and reducing the burden on the social and healthcare system. Our contribution as Teoresi Group has focused on developing the entire intelligence system to manage human–robot interaction, integrating it with the various IT components already in place or under development by consortium partners (such as health records and AR/VR apps for exercises), and conducting field testing of the robot TEO, currently being trialed at our Turin headquarters. Thanks to its autonomous navigation capabilities, 360° sensors, and a simple yet effective conversational interface, TEO can move safely and independently, interact vocally, and guide people through structured environments. This represents a first step toward concrete solutions for monitoring and providing cognitive support to older adults, even remotely," says **Marco Bazzani, Innovation Manager at Teoresi Group**.

AI and Virtual Reality to Monitor Cognitive Functions in Older Adults

The DAISI&RON project integrates robotics, artificial intelligence, and virtual reality into rehabilitative tools for cognitive monitoring and light assistance for seniors. **Clinical coordination** of the project is managed by the **University of Turin**, while **Intravides Srl** handles the **integration of VR and AR devices**, specifically implementing "serious games" to monitor and enhance users' cognitive activities. **Teoresi Group contributes to the development and testing of robotic and AI solutions**, as well as the **programming of the assistive robot TEO**. The robot's sensors are trained to manage autonomous navigation and voice interaction, supported by advanced language models. Users can perform cognitive exercises—

even in game form—via a VR headset, and the data collected is then analyzed and presented in an understandable format by the robot. Research indicates that **around 85% of users are accompanied by a peer caregiver; for this reason, the robot is designed to assist both the vulnerable user and their companion**, guiding them through a pathway that includes interactive activities.

A Robot for a Colleague: Testing TEO at Teoresi's Turin Offices

TEO is designed to perform welcoming and support functions in clinical and care settings. Teoresi Group has **developed the robot's conversational AI** and **autonomous path management capabilities**. Programmed to operate safely, TEO moves at a limited speed (0.4–0.7 m/s) and is equipped with audible signals to ensure its presence is always noticeable. Its 360° active sensors allow movement only forward. Teoresi has launched an initial phase of **experimental testing in real environments** at its Turin headquarters, transforming the ground floor into a dedicated **technological laboratory for TEO**. Here, the robot is observed performing interaction and guidance activities, including answering simple questions, leading visitors along predefined routes, and moving autonomously.

The purpose of the test is to assess, in real-world conditions, the reliability of the developed functionalities, from controlled navigation to user interaction, simulating the challenges of a complex and dynamic environment in preparation for its clinical application. All of this is carried out with full respect for privacy: TEO does not record personal data nor perform facial recognition. The corporate environment thus provides an ideal setting to refine the technologies behind a **new approach to care**: **one that is more empathetic, automated, and personalized**.

Project Roadmap

The project follows a **multi-year roadmap**. The field-testing phase of the technology is currently underway and will continue at least through 2025. In 2026, tests with elderly users will take place in controlled environments—at the Teoresi and University of Turin laboratories, as well as at NICO (Neuroscience Institute Cavalieri Ottolenghi)—alongside trials at the **Neurology Clinic of Prof. Rainero** (an expert in Alzheimer's and senile dementias) and at the Human Anatomy laboratories of Dr. Paolo

Pacca, where students and researchers work in the field of neuroscience. The results will be used to develop intervention models that can be replicated nationally, with particular attention to sustainability and the social impact of adopting technology in elderly care. By 2027, a clinical phase involving seniors with neurodegenerative conditions may also begin.

Teoresi Group
Teoresi was founded in Turin in 1987 as an IT consulting company. Today, Teoresi Group is an international engineering firm present in four countries (Italy, Germany, the United States, and Switzerland) with a total of 27 operational offices, including 15 in Italy located in Turin, Milan, Modena, Rome, and Naples. The Group supports companies in creating projects using cutting-edge technologies, from autonomous vehicles to AI applied to medical diagnostics. With global expertise in engineering, Teoresi Group offers design, development, and technological consulting with a focus on innovation in every project, supporting clients from initial analysis to product conception, from project idea to prototype, and from prototype to market. Since 2023, the Group's growth has also been driven by external acquisitions. In January 2023, Teoresi announced the acquisition of two Italian companies: HiFuture, specializing in hardware and firmware, and BindingFuture, specializing in web, app, and cloud applications. Both companies underwent significant rebranding in 2024 to further integrate their expertise into the Group and strengthen Teoresi's positioning in their respective sectors. In October 2024, the Group integrated the products of the Milan-based IoT Solutions, a company specializing in smart building technologies and solutions to improve workplace comfort, optimize building management, and reduce energy consumption. In 2024, Teoresi also launched the MedTech division, resulting from the Group's investments in the healthcare sector and the 2023 acquisition of the Bologna-based company MediCon Ingegneria.

ANTHEM Foundation
ANTHEM is one of the most significant Italian and European research initiatives, funded with €120 million by the Ministry of Research under the PNC – National Plan for Complementary Investments to the PNRR. It is a multidisciplinary project—spanning medicine, engineering, physics, computer science, and economics—designed to develop innovative technologies and pathways in healthcare and social assistance. The initiative relies on a strong network of partners, including universities, hospitals, private companies, and public institutions, with contributions from civil society, patient associations, and other research organizations. ANTHEM's mission is to improve the care and quality of life of vulnerable and chronic patients, as well as those affected by diseases that currently have no therapy, through intelligent monitoring, prevention and diagnosis, precision medicine, and technological advancement. The Foundation also demonstrates its commitment to education (ANTHEM Edu) by promoting multidisciplinary training programs designed to provide the skills necessary to address the complexity of research and development processes. (fondazioneanthem.it).

Department of Neuroscience, University of Turin
The Department of Neuroscience (DNS) at the University of Turin, named after Rita Levi Montalcini, brings together diverse expertise in basic, translational, and clinical research on the nervous system. Recognized as a Department of Excellence for the five-year periods 2017–2022 and 2023–2027, with extraordinary funding from the Ministry of University and Research (MUR), the DNS hosts numerous laboratories reflecting its wide range of studies on neurodegenerative diseases: brain development and pathology, myopathology, neuroendocrinology, electron microscopy, museology and paleoanthropology, neuropharmacology, biomedical physics, movement analysis, and sleep medicine. The DNS participates, with several of its research groups, in the activities of **NICO – Neuroscience Institute Cavalieri Ottolenghi** in Orbassano (TO), a leading center for experimental neuroscience. NICO hosts numerous young Italian and international scholars in training, including PhD students, research fellows, and thesis students.

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