



## PRESS RELEASE

# The EXTENDER project : helping people with disabilities to operate a robotic arm

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The EXTENDER project, winner of the 2023 Robotics Transfer Challenge call for projects (Défi Transfert Robotique), is developing innovative interfaces to enable people with disabilities to control a robotic arm mounted on their wheelchair. This project is led by major actors such as ISIR (Sorbonne University / CNRS), LAAS-CNRS, CETCOPRA (University Paris 1 Panthéon-Sorbonne), the Auctus project team (Inria Center at the University of Bordeaux), the Pascal Institute (UCA / CNRS), with secondary supervision by the University Hospital of Clermont-Ferrand and a member of Clermont Auvergne INP), the start-up ORTHOPUS, and a healthcare center: ESEAN AFP France Handicap. EXTENDER is part of the France 2030 program, operated by the National Research Agency (ANR) and BPI France.

Presentation of the EXTENDER project, ©ORTHOPUS



## **Transferring Academic Robotics Expertise to Enhance the Autonomy of People with Disabilities**

French research in robotics excels in the field of collaborative robotic arms, known as "cobots," which are designed to assist, support, or replace human actions in industrial environments. These technologies offer promising solutions for the disability sector, as robotic arms could help people with reduced arm or hand mobility regain autonomy.

The objective of the EXTENDER project is to leverage academic expertise in collaborative robotics, developed in research laboratories, to enable wheelchair users to operate a robotic arm for daily tasks. To accommodate a wide range of situations, the main challenge is to design adaptable and customizable solutions based on users' sensory-motor and cognitive capabilities. The project will explore various interfaces, including smart glasses, augmented reality headsets, voice control with generative AI, muscle sensors, motion sensors, and brain activity sensors.

The robotic arm used for testing will be the ORTHOPUS Explorer, developed by ORTHOPUS. As a socially impactful start-up with ESUS certification, ORTHOPUS designs robotic devices to enhance the autonomy of individuals with muscular weakness in their arms. With the results of the EXTENDER project, ORTHOPUS aims to further its social commitment by developing new technological innovations that promote independence, fulfillment, and inclusion for people with motor disabilities.

The EXTENDER project is entering a two-year research phase, after which an industrialization phase will be considered to commercialize the control solutions. This transition will depend on the effectiveness and relevance of the technologies, both in terms of technical performance and user needs.

### **Collaboration at the Heart of the Project**

Through a multidisciplinary approach, the EXTENDER consortium brings together academic, industrial, and medical expertise, involving:

- **Three robotics laboratories:** The Institute of Intelligent Systems and Robotics (ISIR, Sorbonne University / CNRS), the AUCTUS project team (Inria Center at the University of Bordeaux), and the CNRS Laboratory for Analysis and Architecture of Systems (LAAS-CNRS)
- **One start-up from the Handitech ecosystem – part of the France 2030 program:** ORTHOPUS
- **Two operators for preclinical testing:** ESEAN APF France Handicap and the Pascal Institute (UCA / CNRS, with secondary supervision by the University Hospital of Clermont-Ferrand and a member of Clermont Auvergne INP);
- **One research unit specializing in the study of technology usage:** CETCOPRA (University Paris 1 Panthéon-Sorbonne), which focuses on socio-anthropological observation and analysis of technology.

In addition to these organizations, wheelchair users will be involved throughout the project in both the design and evaluation of solutions. Test pilots will participate in the international assistive technology competition, *Cybatlon*. Other users will take part in preclinical alpha and beta testing to assess selected technological components in

laboratory trials. The participation of a research team in the socio-anthropology of technology will go beyond simply evaluating the performance of these technologies (usability, safety, efficiency, etc.) to also consider their usage and the socio-cultural context of their development.



#### **About Sorbonne University:**

*Sorbonne University is a multidisciplinary, research-intensive university covering the humanities, health, science and engineering. Anchored in the heart of Paris and with a regional presence, Sorbonne University has 55,000 students, 4,000 teaching and research staff, 3,300 national researchers and 135 laboratories. Alongside its partners in the Sorbonne University Alliance, and via its institutes and multidisciplinary initiatives, it conducts research and educational activities to strengthen its contribution to the challenges of three major transitions: a global approach to health (One Health), resources for a sustainable planet (One Earth), and changing societies, languages and cultures (One Humanity). Sorbonne University is also a member of Alliance 4EU+, an innovative model for European universities that develops strategic international partnerships and promotes the openness of its community to the rest of the world. <https://www.sorbonne-universite.fr/en>*

#### **About CNRS:**

*A major player in fundamental research worldwide, the Centre national de la recherche scientifique (CNRS; the National Centre for Scientific Research) is the only French organization active in all scientific fields. Its unique position as a multi-specialist enables it to bring together different scientific disciplines to shed light on and understand the challenges of today's world, in conjunction with public and socio-economic players. Together, the sciences are at the service of sustainable progress that benefits society as a whole.*

#### **About University Paris 1 Panthéon-Sorbonne :**

*Université Paris 1 Panthéon-Sorbonne combines the glorious heritage of the college founded by Robert de Sorbon in the 13th century with an innovative multidisciplinary project. As France's leading university in the humanities and social sciences (SHS), it has cultivated a unique spirit since 1971, combining a demanding scientific approach with the ambition to generate new knowledge that transforms the world. Located at 25 sites in the Paris region, and open to the world and to Europe with the Una Europa university of the future, it welcomes almost 45,000 students a year and boasts one of the largest alumni networks on the continent. Thanks to its exceptional range of disciplines, it trains researchers, teachers, professionals, business and government executives, economists, managers, artists... but above all, critical citizens who analyze the world around them and devise concrete solutions to the new challenges facing our society. Today, Université Paris 1 Panthéon-Sorbonne is France's leading university in the humanities and social sciences, committed to putting people back at the heart of its scientific approach and teaching.*

- 45,000 students and 22,000 graduates per year
  - More than 1,400 teaching and research staff
  - 10 doctoral schools and more than one thesis defended every day
  - Motto: *Omnibus sapientia, unicuique excellentia* (Knowledge for all, excellence for everyone)
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