Press Release

Martigny, February 2025

User-Friendly Robot Software Empowers Individuals with Mobility Disabilities

Researchers at Idiap have developed innovative software that simplifies the use of assistive robots for individuals with mobility disabilities. Addressing the challenges of complex and difficult-to-adopt robotic systems, this new technology enables robots to adapt to the unique needs of users, providing a more intuitive and seamless experience for completing everyday tasks.

The software, created by Shalutha Rajapakshe, Emmanuel Senft, and Jean-Marc Odobez, focuses on fostering natural and intuitive human-robot collaboration. It allows users to guide and refine the robot's movements through simple corrections, making the interaction feel more organic. The control interface features a user-friendly joystick, similar to those found on electric wheelchairs, which operates a robotic arm capable of a wide range of activities, from practical tasks like loading a washing machine to creative endeavors such as painting.

A key innovation lies in the software's flexible design, which utilizes a "learning from demonstration" method called "canal surfaces." This efficient approach requires only two demonstrations of a movement to teach the robot the expected behavior and its potential variations. Once learned, the robot can perform the task autonomously. Crucially, when the user employs the joystick, the software intelligently adjusts the input based on the robot's current position. This eliminates the need for users to understand the robot's technical intricacies, making control effortless and natural.

Initial proof-of-concept testing at Idiap involved both able-bodied individuals and wheelchair users. The results demonstrated the solution's superior performance compared to basic control methods and its effectiveness in meeting the specific needs of individuals with movement impairments. Notably, participants with disabilities expressed strong interest in the technology, recognizing its potential to significantly improve various aspects of their daily lives.

This research highlights the transformative potential of assistive robotics in enhancing the lives of individuals with mobility disabilities. The next phase for the Idiap team involves exploring the practicalities of deploying this system in real-world home environments, bringing this life-changing technology closer to those who stand to benefit most.

The study detailing this innovative software was presented at the 20th IEEE Conference on Human-Robot Interaction (HRI).

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About

The Idiap Research Institute, located in Martigny, Switzerland, is a Swiss and world leader in artificial intelligence since 1991. With almost 200 employees, the Institute is specialized in several fields of AI, organized into four research programs: Human-AI Teaming, AI for Life, AI for All, and Resilient & Sustainable Societies. In addition to its cutting-edge research, Idiap actively participates in local, national, and international projects, fosters collaborations with companies, and drives continuous innovation in the field.