

OPEN POSITION: RESEARCHER IN BIOMECHANICS OF HUMAN MOVEMENT

PROJECT TITLE: ABLE DailyExo: The next generation of smart robotic exoskeletons to assist people with disabilities in everyday life activities

PROJECT SUMMARY

Enabling people to move on their own is crucial to unleashing full human potential. Mobility is a fundamental part of living in society independently and freely, engaging in daily activities like working and enjoying leisure time. With population ageing, the number of neurological diseases has increased dramatically in recent years, already affecting more than 1 billion people and causing nearly 7 million deaths a year. These people see their mobility and independence reduced in their daily life due to disability. The aim of ABLE DailyExo is to develop and clinically validate the next generation of smart robotic exoskeletons to assist people with disabilities in everyday life activities. A breakthrough technology that will help them to regain mobility and independence in their daily lives, performing on their own activities such as walking indoors and outdoors, climbing stairs, opening a door, and enjoying conversations with friends and family at an eye-level again. With this, the project aims to unleash the full potential of exoskeleton technology to break the barriers of mobility and independence that people with impairments face every day, improving their quality of life and letting everyone live a more human life. The consortium of the project (BIOMECH and ABLE Human Motion) strongly believes that the results obtained in this project will disrupt recent advances in the field of applied neurotechnology with the integration of innovative technologies (biomechanics, robotics, machine learning, electric motors, mechatronics design, digital health) to make a difference in the robotic field and especially in the daily lives of people with disabilities, with the creation of the first smart robotic exoskeleton to assist them in real-world environments.

YOUR TASKS

You will be involved in research and development tasks related to the project. Your tasks will include:

- Development of subject-specific musculoskeletal models of the human body.
- Development of physics-based exoskeleton models.
- Implementation of optimal control-based algorithms to simulate activities of everyday life (e.g., stair climbing/descent, walking on a slope).
- Biomechanical analysis of activities of everyday life.
- Development of pilot studies with healthy and impaired participants.
- Disseminating research in scientific conferences and through journal publications.
- Mentoring Master's students working on related topics.

YOUR PROFILE

- Master's degree (required) or PhD degree (preferred) in Mechanical or Biomedical Engineering.
- Experience in programming, human movement biomechanics, and optimal control.
- Creativity, curiosity and humbleness.
- Interpersonal, organizational and communication skills.
- Proficient in written and oral English.

INFORMATION AND APPLICATION

Apply by **February 10th, 2023** by sending an email to josep.m.font@upc.edu (Email subject: "Biomechanics Researcher ABLE DailyExo"). Applications should include the following documents:

- A cover letter specifying your relevant past experience and research interests.
- A complete CV including English proficiency level, nationality, date of birth, education and professional experience.
- Transcripts of BSc and MSc degrees.
- Contact information for at least two references.

The successful candidate will ideally start on March 15th, 2023 or as soon as possible after that date.

For questions, please contact josep.m.font@upc.edu.

OUR OFFER

- A 2.5-year fully-funded postdoctoral position.
- Outstanding R&D ecosystem within [CREB-UPC](#), in collaboration with the spin-off [ABLE Human Motion](#).
- Access to fully-equipped [Motion Analysis Laboratory](#) and [CREB facilities](#).
- Living in Barcelona, a modern city with a lot of opportunities for R&D in the HealthTech sector.
- Fun work atmosphere with regular meetings and social events.

THE CONSORTIUM

UPC. The [Universitat Politècnica de Catalunya](#) is a public institution of research and higher education in the fields of engineering, architecture, sciences, and technology; and one of the leading technical universities in Europe. Every year, more than 6.000 Bachelor's and Master's students and more than 500 doctoral students graduate. The UPC has a high graduate employment rate: 93% of its graduates are in work and 76% find a job in less than three months. UPC is the Spanish university that has obtained more projects from Horizon 2020 framework.

CREB. Since 1983, the [Research Centre for Biomedical Engineering](#) at UPC has been serving the needs of research, technological development, innovation, and knowledge transfer of companies, hospitals and institutions related to the field of health technologies. Its multidisciplinary staff includes more than 80 researchers, doctors and graduates in engineering and other disciplines. Our research teams and facilities are in the heart of UPC campus, giving solution to any need or demand from the biomedical field. Our applied research is organized in seven research areas: Biomaterials; Biomedical Signals and Systems; Dosimetry and Medical Radiation; Computer Graphics; Biomechanical Engineering; Robotics and Vision; and Instrumentation and eHealth. From these areas we support and promote innovation and collaboration, as well as excellence in research, scholarship, and training. Within CREB, the [BIOMECH Lab](#) does research in multibody simulation of human movement and design of biomechatronic devices for clinical rehabilitation.

ABLE. [ABLE Human Motion](#) is a spin-off company from the mother institution UPC that was created to bring into the market innovative exoskeleton technology. It was founded in October 2018 after several years of research and development by the UPC Biomechanical Engineering Lab at Research Centre for Biomedical Engineering (CREB). The company was born with a clear mission: enabling mobility, to everyone, aiming to drive widespread patient access to robotic rehabilitation technology. The company has developed the ABLE Exoskeleton, a lightweight robotic exoskeleton for hospital use that has already helped more than 100 patients to walk again in multiple rehabilitation centers across Europe. ABLE is currently positioned among the most promising medical device start-ups in Europe, awarded as Best European Robotics Startup in 2020 and the Toyota Startup "Mobility for All" competition.