

POST-DOCTORAL FELLOW IN MECHANICAL MODELLING AND MECHATRONICS FOR CLINICAL EXOSKELETON DEVELOPMENT

PROJECT TITLE: ABLE Exoskeleton

JOB DESCRIPTION

Spinal cord injury (SCI) is a catastrophic event that thrusts 5M people worldwide into a life challenged by disability. People with a SCI could walk again if they had a robotic exoskeleton to restore the leg movements affected by the injury. However, current solutions are expensive, heavy and require professional supervision. Thus, they are only found in large hospitals and are out of reach for the patient. The **Biomechanical Engineering Lab (BIOMEC)** at CREB-UPC (<http://biomec.upc.edu>) is seeking for a creative and outstanding post-doctoral fellow to work within the EIT Health Innovation project ABLE Exoskeleton. You will become part of a growing team of biomechanists, roboticists, as well as renowned clinical centres in Europe.

The project seeks to validate the ABLE exoskeleton, currently developed by the start-up **ABLE Human Motion** (<http://ablehumanmotion.com>), through a multi-site clinical trial in Institut Guttmann Neurorehabilitation Hospital (Spain) and Heidelberg University Hospital (Germany). ABLE is the first lightweight, easy-to-use and affordable exoskeleton that restores the patient's ability to walk naturally and intuitively. Through the project, a new version of the exoskeleton for homecare use will be developed and validated. The ABLE Exoskeleton project encompasses a large international consortium with academic, clinical, and industrial partners.

Your tasks:

You will be involved in research and development tasks related to the project. These will imply working hand by hand with a multidisciplinary team of roboticists, biomechanists, patients, and clinical staff. Your tasks will include:

- Developing mechanical models for simulating human-exoskeleton performance in different movement tasks.
- Identifying exoskeleton home-use requirements and data gathering in a living laboratory.
- Selecting sensors, controllers and electronic components for the home-use application.
- Developing control algorithms based on human-robot interaction.
- Prototyping and assembling exoskeleton parts (mechanical and electronic).
- Mentoring Master's and PhD students working on related topics.

YOUR PROFILE

- University degree in mechanical, mechatronics, or biomedical engineering.
- PhD degree in robotics, mechatronics or human movement biomechanics.
- Strong experience in mechatronics and human movement biomechanics.
- Creativity, curiosity and humbleness.
- Interpersonal, organizational and communication skills.
- Proficient in written and oral English.

INFORMATION AND APPLICATION

Apply by January 30th, 2020 by sending an email to josep.m.font@upc.edu. Applications should include the following documents:

- A cover letter specifying how your experience and PhD work match with the offered post-doctoral position.
- A CV including English proficiency level, nationality, visa requirements, date of birth, experience overview, and publication list.
- Transcripts of BSc and MSc degrees.
- Contact information for at least two references.

The successful candidate will ideally start on March 1st, 2020 or as soon as possible after that date.

For questions, please contact Assoc. Prof. Josep M. Font-Llagunes by email: josep.m.font@upc.edu

OUR OFFER

- A fulltime post-doctoral position for a duration of 34 months.
- A salary of approx. 25.000 € gross per year.
- Outstanding research and innovation ecosystem within our research lab at CREB and door-by-door with the start-up company ABLE Human Motion.
- Access to fully-equipped Motion Analysis Laboratory and Mechatronics Workshop.
- Living in Barcelona, a modern city with a lot of opportunities for innovation in the HealthTech sector.
- Fun work atmosphere with social events.

THE ORGANIZATIONS

UPC. The Universitat Politècnica de Catalunya (<http://www.upc.edu>) 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 (<http://creb.upc.edu>) 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 Human Motion. ABLE is a recent spin-off company of UPC that creates robotic exoskeletons to improve the quality of life of people with disabilities. ABLE is developing the first lightweight, easy-to-use and affordable exoskeleton for people with lower limb paralysis that restores the ability to walk naturally and intuitively. It helps in palliating health issues caused by sedentary lifestyle while boosting self-confidence and independence. The vision of the company is a world where everyone has the freedom to move. Its mission is to enhance human mobility and independence through lightweight, easy-to-use, and affordable technology.