BIOMECHANICS AND ASSISTIVE TECHNOLOGIES GROUP

PIs: Antonio J. del-Ama, Eng, PhD

Internship type: Applied Research and that includes work with patients

Internship Language: English/Spanish

Location: National Hospital for Paraplegics, Toledo. The hospital is at 50 minutes bus ride from Madrid. The National Hospital for Paraplegics is a monographic state hospital founded in 1974 to treat patients with spinal cord injuries and address their specific needs. The hospital is also among the very few in Europe for housing clinicians, basic scientists, therapists, psychologists and support personnel whose expertise relates directly to the spinal cord injury.

Summary

Spinal cord injury (SCI) causes severe movement disorders which, in many cases require assistive technology to compensate for impaired motor function. Framed within the National Hospital for Paraplegics, the Biomechanics and Assistive Technology unit (UBAT) aims to create, transfer, disseminate, develop and innovate in scientific knowledge, techniques, technologies and new forms of treatment/ analysis of the motor function and the consequences on the mobility of the people affected by a spinal cord injury, from a engineering and clinical, interdisciplinary, perspective. The UBAT actively pursue innovative and cutting-edge research and development of technologies that improve functional and/or health outcomes of people with SCI. Our research activity focuses on the biomechanics of impaired movement, the evaluation of assistive technology, and the use of virtual reality for patients with SCI. Movement analysis techniques are applied to assess pathological function, investigate effects of assistive technology, drive evidence-based treatments as well as to provide criteria for designing and evaluating robotic devices. Besides, the biomechanical analysis of pathologic motor function contributes to unveil the functional impact of new technologies on the mechanisms of neuroplasticity.
Along with our research activities, the UBAT also features a comprehensive portfolio of biomechanical-based services, open to the clinical staff of the Hospital for providing objective data of motor function.

Activities

Students will have the opportunity to learn about the analysis and evaluation of neuro-musculoskeletal and cognitive systems that allow human beings to produce movements. In that context, students will be offered to observe (shadowing) or participate personally in multi-channel data collection and analysis during intact and SCI-impaired gait in human subjects, gait training in SCI patients, wheelchair manual propulsion training in patients with different levels of SCI and study of biomechanical compatibility between patients' anatomy and exoskeletons, amongst others.

Requirements

Typically students should have passed an introductory Biology or Neuroscience course. They will be under supervision of a post-doc or lab technician while working on research questions and/or methods that are feasible for students participating in research for the first time.