



UT Austin Portugal | 2019 Strategic Research Projects

NANOTECHNOLOGIES

Start Date: 01-APR-2020

Duration: 36 months

Operation Code: 45908

NanoStim

Nanomaterials for wearable-based integrated biostimulation

Motor deficiencies are one of the most severe diseases affecting the elderly, which results in high monetary and social costs. The NanoStim project will develop a wearable with integrated electro-stimulation that allows the rehabilitation of advanced muscle injuries or muscles affected by the lack of mobility and paves the way for a truly patient-centered medical device.

Keywords: Nanomaterials, muscles, wearables, health



Main challenge/problem the project seeks to address

Motor deficiencies are one of the most serious diseases affecting the elderly, as an elderly person with reduced mobility needs the support of others, resulting in large monetary and social costs. The accelerating ageing of populations in advanced countries means that this the problem will only increase in coming decades.

Proposed solution

A high-performance system of dry and flexible (nano) sensors embedded into clothing that administer electrostimulation to severe muscle injuries or muscles affected by a lack of mobility. The system, which builds on Artificial Intelligence and can be remotely controlled by health professionals, represents the possibility of combining diagnosis, therapy and rehabilitation into a single, truly patient-centered medical device to be used anywhere.

Innovative Potential

Based on a biofeedback approach monitored at a distance by health professionals, NanoStim ensures a complete analysis therapy with addition of real-time correction. This represents a truly innovative approach to the treatment of neurological and skeletal muscular diseases, whilst increasing the degree of freedom and comfort of the patient and decentralizing treatment and rehabilitation from health care centers. NanoStim allows the application of therapy at home, without the presence of medical staff or formal caretakers, hence reducing social and economic burdens.

Target beneficiaries

The team envisions its project as a tool mostly for elderly people, creating a mobile rehabilitation option for people who have trouble getting to a doctor's office consistently or want greater freedom to complete treatment anywhere. Additionally, the team recognizes the potential of derived applications for training high-level athletes as well.

Consortium

PORTUGAL

Increase Time (Lead Beneficiary)

- University of Minho
- Polytechnic Institute of Bragança
- Impetus Portugal
- TEandM
- Nelson Azevedo Terapias Globais

USA - UT AUSTIN'S PRINCIPAL INVESTIGATORS

- George Biros (Cockrell School of Engineering, and Oden Institute for Computational Engineering and Sciences)
- Michael A. Cullinan (Cockrell School of Engineering)

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