Efficient Multibody Interactive Simulation for Soft Robotics

Fact Sheet

Project Information

EMISSR

Grant agreement ID: 799001

Project website

DOI
10.3030/799001

Project closed

EC signature date
19 March 2018

Start date
14 January 2019

End date
13 January 2021

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 212 194,80

EU contribution
€ 212 194,80

Coordinated by
KOBENHAVNS UNIVERSITET
Denmark

Objective

The aim of the EMISSR project is to create a novel multibody dynamics simulator for soft robotics. The originality of the
project consists in a unified constraint based formulation that can couple rigid and flexible bodies in the same solver. The
argument behind a simulator for soft robotics is the fact that traditional robots are not suitable for working in humans and
their control has proven daunting especially for nonlinear underactuated systems. The new field of soft robotics is seeing
great growth and investment around the globe and Europe needs to seize this

economic opportunity. New dynamics
simulations and control algorithms are needed for soft robots, that are made up of soft parts and biology inspired actuators.
EMISSR wants to fill in this gap and aims to become a testbed for training control policies based on machine learning and
other algorithms. In terms of performance and accuracy, EMISSR will be a high-fidelity interactive simulator, meaning that it
will be extremely fast due to its multilevel solver and parallel implementation, while not sacrificing much of the accuracy
needed for soft robotics applications. The frictional contact and deformable continua models will not make any unphysical
approximations. The elements that will distinguish EMISSR from other existing projects are: two-way coupling of rigid and
soft bodies, a fast multilevel iterative solver, stability for high mass ratios and transversal oscillations and robust contact
information generation. These will be applied to making virtual replicas of soft robots (e.g. soft body parts, artificial muscles
and tendons, pneumatic tubes), simulating their dynamics and testing machine learning based control policies for large
numbers of degrees of freedom. At the same time, the training programme that UCPH offers matches my career
development needs perfectly, allowing me to build upon my current competencies, not forgetting the opportunity to enhance
my academic profile and teaching experience.

Fields of science (EuroSciVoc)

engineering and technology > electrical engineering, electronic engineering, information engineering > electronic engineering > robotics > **soft robotics**

natural sciences > computer and information sciences > artificial intelligence > **machine learning**

Programme(s)

H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions MAIN PROGRAMME

H2020-EU.1.3.2. - Nurturing excellence by means of cross-border and cross-sector mobility

Topic(s)

MSCA-IF-2017 - Individual Fellowships

Call for proposal

H2020-MSCA-IF-2017

See other projects for this call

Funding Scheme

MSCA-IF-EF-CAR - CAR – Career Restart panel

Coordinator

KOBENHAVNS UNIVERSITET

Net EU contribution

€ 212 194,80

Total cost

€ 212 194,80

Address

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1165 Kobenhavn
Denmark

Region

Danmark > Hovedstaden > Byen København

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 23 August 2022

Permalink: https://cordis.europa.eu/project/id/799001