

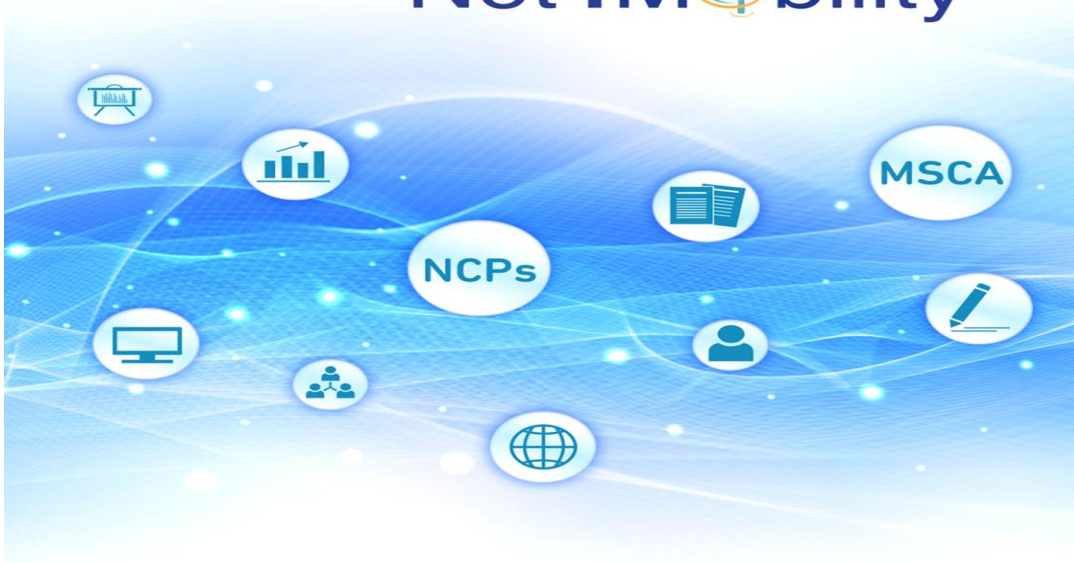


European Project

Cyber Physical Systems for PEdagogical Rehabilitation in Special Education

Acronym: **CybSPEED**

Net4Mobility⁺

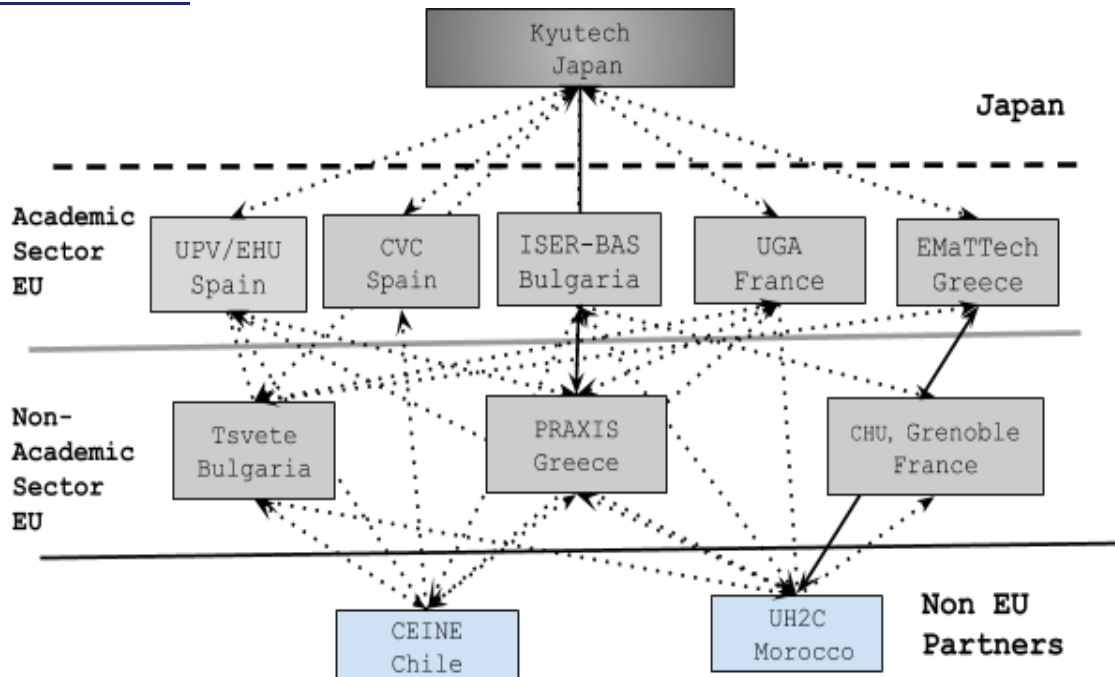


Type of MSC action: RISE (Research and Innovation Staff Exchange)

Start 01.12.2017 - end 30.11.2021

Budget: 1 386 000 €

Consortium:



A little history:



The idea for submitting the multidisciplinary collaborative project CybSPEED on a topic related to using the multi-level pedagogical potential of robotic technology, including understanding social mechanisms by artificial agents/robots, was born within the :

- 3rd European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics, Project no.: 269981, Coordination Action, European Commission,
- 7th Research Framework Programme, Information and Communication Technologies"

where many of the key researchers in CybSPEED participated: UPV/EHU (Spain), IR-BAS (Bulgaria), EMatTech (Greece) and CVC/UAB (Spain).

Then, the core partners invited :

- PRAXIS Ltd. (Greece) and Theater Tsvete (Bulgaria) to provide practical knowledge on work with children and adolescents possibly vulnerable due to preexisting conditions,
- UGA (France) and CHUGA (France) to provide expertise in Virtual Reality implemented for sensation resoring,

as well three oversea international partners :

- Kyutech (Japan), CEINE (Chile) and UH2C (Morocco) with whom there were previous sereach links in computational modeling, neurocomputation and robotics.

The configuration of organisations was most appropriate for a Marie Sklodovska Curie Action RISE - Research and Innovation Staff Exchange – consisting of 5 academic and 3 practical-field beneficiaries as well as 3 international academeic partners.

Professor Manuel Grana from UPV/EHU (Spain) was elected unanimously the Coordinator of the project by the project team.

Project objectives and research field:



The objective of CybSPEED project is to: analyse, synthesise, model, evaluate and implemente Cyber-physical systems for pedagogical rehabilitation in special education.

The research field is highly multidisciplinary and involves specialists from pedagogical sciences, special education, psychology, neuropsychology, medicine, biomechanics, computational modeling and simultion, neurocomputation, mechatronics, robotics, Virtual Reality,....

The topic is very important, because it deals with the education (school and university) of the future. By bringing the most recent tehcnological and computational advances into schools and universities in an integrative manner, the aim of education will become more achievable, namely to provide individualised style of education to every students according to their learning and developmental needs.

A number of studies within CybSPEED are underway, including :

- Electromyography (EMG) ,
- Electroencephalography (EEG),
- eye-tracking recording,
-

applied to investigate how people perceive lessons provided with the help of new technologies such as robots and how robots help attract and maintain the attention focus during the lesson.

A group of studies is bringing robotic and other interactive technology (e.g. Kinect, EmoSan, Leap MOTION, Myo, ...) to the field - the day centers - where

observations by specialists will help understand the pros and cons of technology brought to education.

A number of simulations of the learning process based on high-level abstract computational models, guided by EMatTech and UPV/EHU, are currently underway.

The final result of CybSPEED is expected to be a novel framework for design of cyber-physical systems for pedagogical rehabilitation in special education.

Benefits of CybSPEED

The benefits of participating in CybSPEED in the frame of a Marie Skłodowska Curie (MSC) action, among others, are:

- Transfer of knowledge and research ideas among countries of different continents thus making the most for each individual researcher career,
- Getting to know each other more closely and learning to work in diverse multidisciplinary teams,
- Bringing ideas from practice into academia and vice versa,
- Collaborating in a democratic research community where hierarchies among people are brought to a minimum.

Successes under the project were the two *Trainings* that took place in Sofia and Kavala in 2018. Other two *Trainings* are scheduled: one in Grenoble (2019) and another one in Casablanca (2020).

The aim of those *Trainings* is to integrate approaches of "hard" and soft training to bring together the participants in an informal, team building manner.

A first international scientific conference in the frame of CybSPEED took place in August 2018 in Varna on "*Robotics & Mechatronics and Social Implementation* » presenting the first obtained results from the implementation of the CybSPEED project.

Other conferences are scheduled in Kavala and San Sebastian.