MARIE SKŁODOWSKA-CURIE ACTIONS

Innovative Training Networks (ITN)

Call: H2020-MSCA-ITN-2019

PART B

SMART: Soft/Self responsive/Smart MAterials for RoboTs

SMART

Soft, Self-responsive, Smart MAterials for RoboTs

training network

This proposal is to be evaluated as:

ETN

Consortium member	Legal entity short name	Academic	Non-academic	Awards doctoral degrees	Country	Department/ division/ Laboratory	Scientist in charge	
BENEFICIARIES								
Vrije Universiteit Brussel	VUB (R&MM + FYSC)	X		X	Belgium	Robotics and Multibody Mechanics & Physical Chemistry and Polymer Science	Bram VANDER-BORGHT & Guy VAN ASSCHE	
University of Cambridge	UCAM	X		X	UK	Machine Intelligence Laboratory	Fumiya IIDA	
Scuola Superiore Sant'Anna	SSSA	X		X	Italy	The Robotics Institute	Cecilia LASCHI	
Tallinn University of Technology	TalTech	X		X	Estonia	Centre for Biorobotics	Maarja KRUUSMAA	
Bilkent University	BUCHEM	X		X	Turkey	Baytekin Research Group	Bilge BAYTEKIN	
Swiss Federal Laboratories for Materials Science and Technology	EMPA	X			Switzerland	Functional Polymers & High Performance Ceramics	Dorina OPRIS & Frank CLEMENS	
Polymer Competence Center Leoben	PCCL	X			Austria		Sandra SCHLÖGL	
Suprapolix	SUPRA		X		The Netherlands		Tonny BOSMAN	
PARTNER ORGANIZATIONS								**Role of partner organisation**
Octinion			X		Belgium		Tom COEN	Supervisory board/ training/secondments/ test beds
Festo			X		Germany		Daniël BRAUCHLE	Supervisory board/ training/secondments/ test beds/company tour
InnoTecUK			X		UK		Gurvinder VIRK	Supervisory board/ training/secondments/ test beds/company tour
Robotech srl			X		Italy		Giancarlo TETI	Supervisory board/ training/secondments/ company tour
Spin-PET srl			X		Italy		Francesco CIANDELLI	Supervisory board/ training/secondments/ test beds/company tour
Shadow Robot Company			X		UK		Rich WALKER	Supervisory board/ training/secondments/ test beds
Centexbel			X		Belgium		Myriam VANNESTE	Supervisory board/ secondments/ company visit/test material
Sateco AG			X		Switzerland		Daniel HAEFLIGER	Supervisory board/ secondments/ industrialisation aid
CTSystems			X		Switzerland		Gabor KOVACS	Supervisory board/ training/ secondments/ infrastructure
Semperit AG			X		Austria		Armin HOLZNER	Supervisory board/ secondments
Aglycon			X		Austria		Josef SPREITZ	Supervisory board/

secondments

Name	Location of research premises	Type of R&D activities	No. of full-time empl.	No. of empl. in R&D	Website	Annual turnover (in MEuro)	Enter-prise status	SME status
SUPRA	Eindhoven, The Netherlands	Material research	6	4	http://www.suprapolix.com/	< 5	YES	YES

Abstract

The SMART Innovative Training Network is a joint venture between academia and industry, providing scientific and personal development of young researchers in the multidisciplinary fields of soft robotics and smart materials. SMART will realize the technologically and scientifically ambitious breakthroughs to exploit smart, stimuli-responsive material systems with actuation, sensing and self-healing capabilities for intelligent soft devices. This allows the soft robots to interact with dynamic and unknown environments in a smart fashion to avert catastrophic failure and re-establish structural integrity and operational functionality. Control intelligence enables interaction with the outer world and structural health monitoring allows the establishment of autonomous healing procedures, where upon sensing of damage or loss of functionality the system will cease operation and start a repair action, followed by the evaluation of the effective recovery of functionality and finally return to operation, thus expanding the service lifetime. These technologies will be integrated in fully functional and autonomous demonstrators to disseminate, benchmark and exploit the results.

There is a need for future leaders with excellence in smart material systems and technologically advanced applications such as robotics and automation. The SMART ITN offers such multidisciplinary training by combining these two emerging fields with meaningful societal and economic impact (T-model). For this purpose, SMART brings together 8 beneficiaries and 11 partner organizations including 2 research institutes and 12 private companies, belonging to 7 EU member states, and to 2 associated states (Switzerland, Turkey). The consortium's complementarity and multidisciplinarity will enable a top-level educational programme, with special focus on spanning TRL levels from innovative fundamentally new concepts to system prototypes and teaching them in a responsible research and innovation (RRI) spirit.