

# Call for PhD Position-Rewire Marie Sklodowska-Curie Doctoral Network

*Design of a robotic soft exosuit for gross manipulation restoration after spinal cord injury*

**PhD in Emerging Technologies,  
Scuola Superiore Sant'Anna**  
**Hosting Institution:** Wearable Robot  
cs srl  
**Tutor(s):** Prof. Antonio Frisoli,



Sant'Anna  
Scuola Universitaria Superiore Pisa



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## **A PhD position in Robotics is available within the Phd in Emerging Digital Technologies at Scuola Superiore Sant'Anna**

**Description:** The main objective is to develop a robotic soft exosuit for gross manipulation restoration after spinal cord injury. A soft, lightweight, stretchy and wearable active robotic exosuit will be designed to access inner muscles and peripheral nerves, responsible for movement of proximal joints of upper limbs. The efficacy of a hybrid combination for control of both distal and proximal joints inside the arm will be investigated. In contrast to most conventional robotic architectures that are still stationary and used as workstations to deliver therapeutic exercises and mobilize the affected limb, soft exosuits provide a natural step forward in wearable assistive technology.

**Requirements:** Applicants are expected to hold a master degree in one of the following or related areas:  
**Expertise:** Mechanical/robotics engineering, Electrical Engineering, Biomedical Engineering.

### References:

- A randomized clinical control study on the efficacy of three-dimensional upper limb robotic exoskeleton training in chronic stroke A Frisoli, M Barsotti, E Sotgiu, G Lamola, C Procopio, C Chisari *Journal of NeuroEngineering and Rehabilitation* 19 (1), 1-14
- Analysis and Preliminary Design of a Passive Upper Limb Exoskeleton G Vazzoler, P Bilancia, G Berselli, M Fontana, A Frisoli *IEEE Transactions on Medical Robotics and Bionics* 4 (3), 558-569
- Myoelectric or Force Control? A Comparative Study on a Soft Arm Exosuit N Lotti, M Xiloyannis, F Missiroli, C Bokranz, D Chiaradia, A Frisoli et al *IEEE Transactions on Robotics*
- Design and Control of a Linear Springs-Based Rotary Series Elastic Actuator for Portable Assistive Exoskeletons L Tiseni, G Rinaldi, D Chiaradia, A Frisoli *2021 30th IEEE International Conference on Robot & Human Interactive ...*
- An assistive soft wrist exosuit for flexion movements with an ergonomic reinforced glove D Chiaradia, L Tiseni, M Xiloyannis, M Solazzi, L Masia, A Frisoli *Frontiers in Robotics and AI* 7,
- Physiological and kinematic effects of a soft exosuit on arm movements M Xiloyannis, D Chiaradia, A Frisoli, L Masia *Journal of neuroengineering and rehabilitation* 16 (1), 1-15

### Contacts:

**Email:** a.frisoli@wearable-robotics.com; antonio.frisoli@santannapisa.it

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**Deadline:** June 11, 2023

**How to apply:** Refer to <http://www.wearable-robotics.com/kinetek/?p=721>

**Further information:** submit your application to a.frisoli@wearable-robotics.com