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Innovation Transfer Through Start-up Creation

- Outlook on technologies showcased at
Hannover Messe 2019 -

Dr. Jan Kerschgens
Managing Director NCCR Robotics



SWISS NATIONAL SCIENCE FOUNDATION



NCCR Robotics Director: Prof.
Dario Floreano, EPFL
NCCR Robotics Co-Director:
Prof Robert Riener, ETHZ

Swiss National
Centre of Competence
in Research



Intelligent robots for restoring, preserving and assisting humans

12 years

TECH
TRANSFER

65 Mio CHF

STRUCTURAL
CHANGE

RESEARCH

OUTREACH

EDUCATION
EQUAL OPP.



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Intelligent robots for restoring, preserving and assisting humans



**WEARABLE
ROBOTS**



**MOBILE
ROBOTS**



**EDUCATIONAL
ROBOTS**











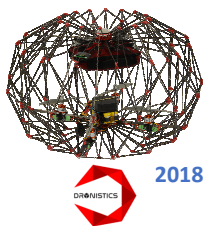

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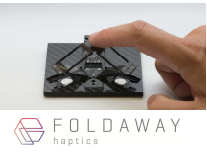


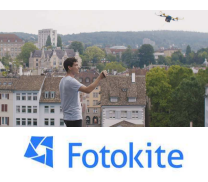






























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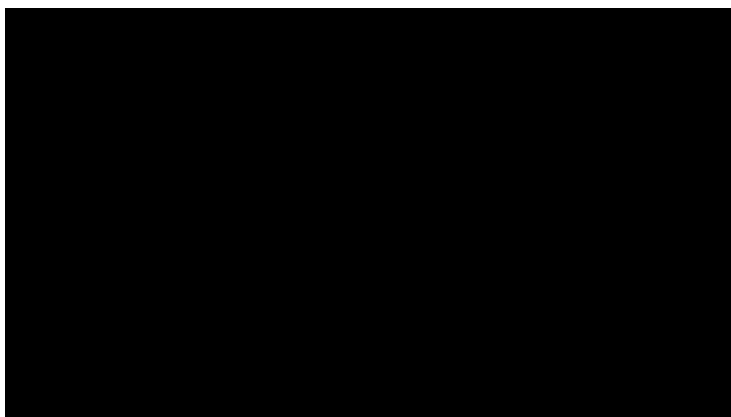
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ANYbotics



- ANYbotics develops the highly mobile legged robot ANYmal and the robotic actuator ANYdrive
- ANYmal is designed to reach difficult places and carry out autonomous inspection and maintenance work in industry, surveillance, agriculture, and more.
- ANYbotics has been founded 2016 and employs 25 people



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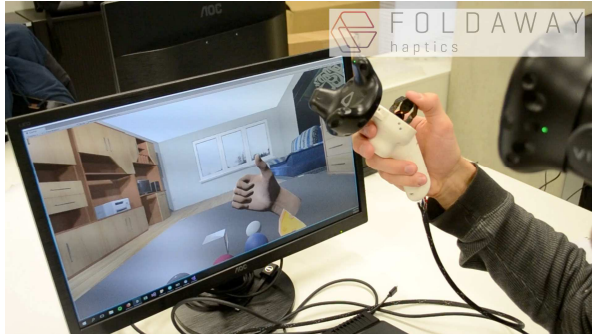


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FOLDaway Haptics makes force rendering joysticks for everyone's pockets



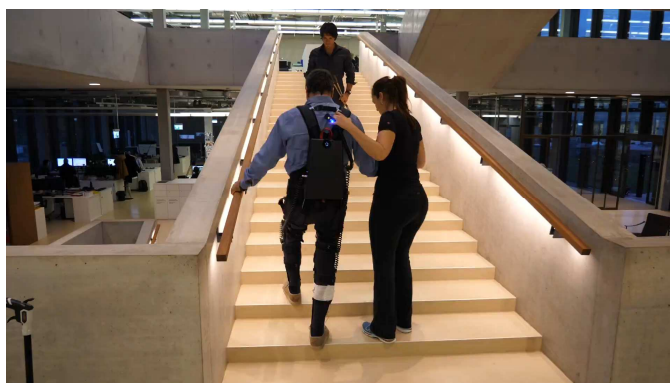
Key facts:

- Awarded as best demo at the IEEE Haptic Symposium 2018
- Funding 500 kCHF
- Market of interest: VR/AR and automotive

"It can offer much richer information about the virtual world, which has the potential to add to immersion" – Road to VR



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Founded: 2017

The MyoSuit – a wearable extra muscle that assists with activities of daily life

- Walking
- Sitting transfers
- Stairs

myo.swiss
@myoswiss
info@myoswiss.com

Patient 1: Incomplete SCI
Patient 2: Muscle Dystrophy



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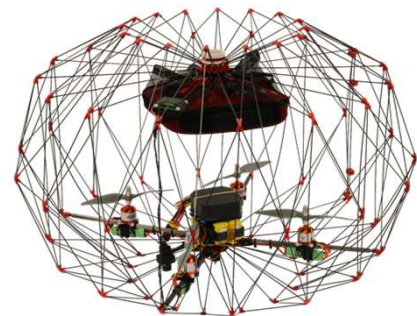




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A safe person-to-person,
last-cm drone delivery system



PackDrone

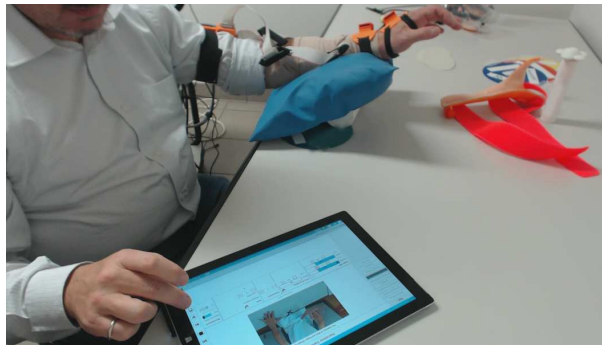
WebApp

- Safe
- Landing in-hands
- Foldable 90%
- Autonomous
- Multiple devices



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Stroke patients motor reconditioning

Founded: **2019**

Quantitative neuro-rehabilitation technology to assist clinical decisions.

- active muscle conditioning
- body representation enhancement
- monitoring the **quality** of voluntary muscle **control**

contact@fes-ability.ch



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- Seamless integration in mobile platforms
- Autonomously navigation in crowded and challenging environments
- Support a variety of applications



www.sevensense.ch



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Vision-based navigation

Redundant safety

Obstacle avoidance



mano

A wearable hand exoskeleton for activities of daily living



Portable
Lightweight & untethered



Functional grasps
Active opening & closing



Customizable control
Voice, Smartphone



Soft actuation
Proprietary tendon technology



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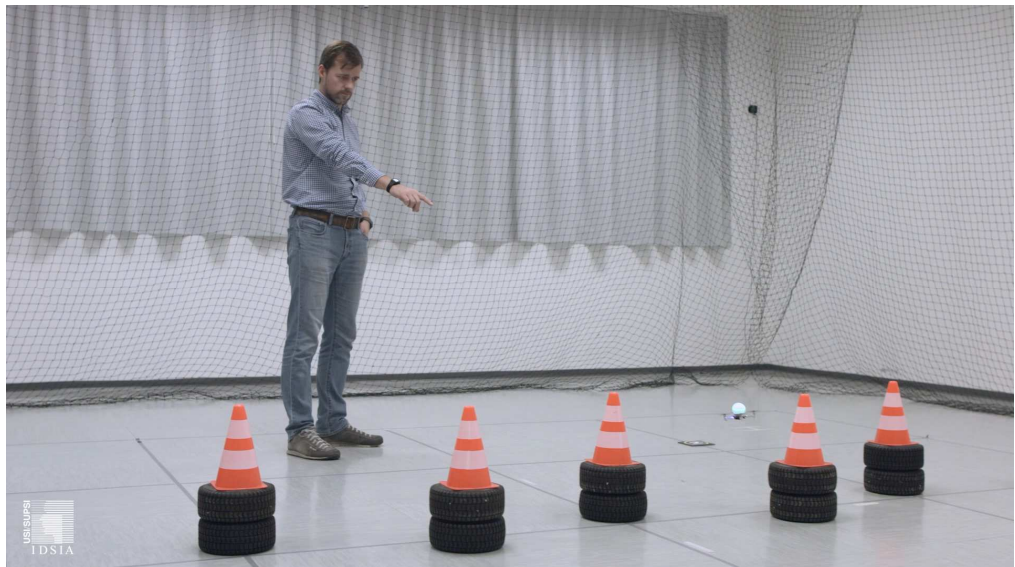
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robotics

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VOLALY

- Control drones & robots by pointing
- Minimal training:
< 1 min
- Simple hardware:
 - smartwatch / cellphone
- Robots do not need to sense the user



POINTING GESTURES FOR HUMAN-ROBOT PROXIMITY INTERACTION



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Drones learn to navigate autonomously by imitating cars and bicycles



Developed by UZH researchers, the algorithm DroNet allows drones to fly completely by themselves through the streets of a city and in indoor environments. Therefore, the algorithms had to learn traffic rules and adapt training examples from cyclists and car drivers.



All today's commercial drones use GPS, which works fine above building roofs and in high altitudes. But what, when the drones have to navigate autonomously at low altitude among tall buildings or in the dense, unstructured city streets with cars, cyclists or pedestrians suddenly crossing their way? Until now, commercial drones are not able to quickly react to such unforeseen events.

Integrate autonomously navigating drones
Researchers of the University of Zurich and the National Centre of Competence in Research NCCR Robotics developed Orca, an algorithm that can safely drive a drone through the streets of a city. Designed as a fast but layers optimal network, it produces two outputs for each single input image: a steering angle to keep the drone navigating while avoiding obstacles, and a collision probability to let the drone recognise dangerous situations and

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