



Soft Robotics for Intuitive Invisible Interactions

Prof. Jamie Paik

Reconfigurable Robotics Laboratory

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 @robotician

Reconfigurable robots

2

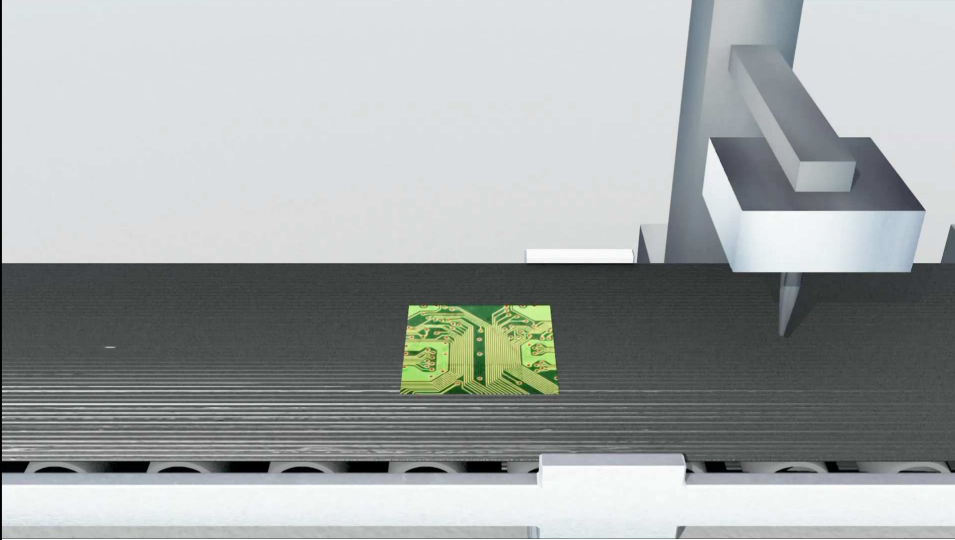


<https://www.youtube.com/watch?v=SHPibEyeDe0&feature=youtu.be>



Robogami manufacturing

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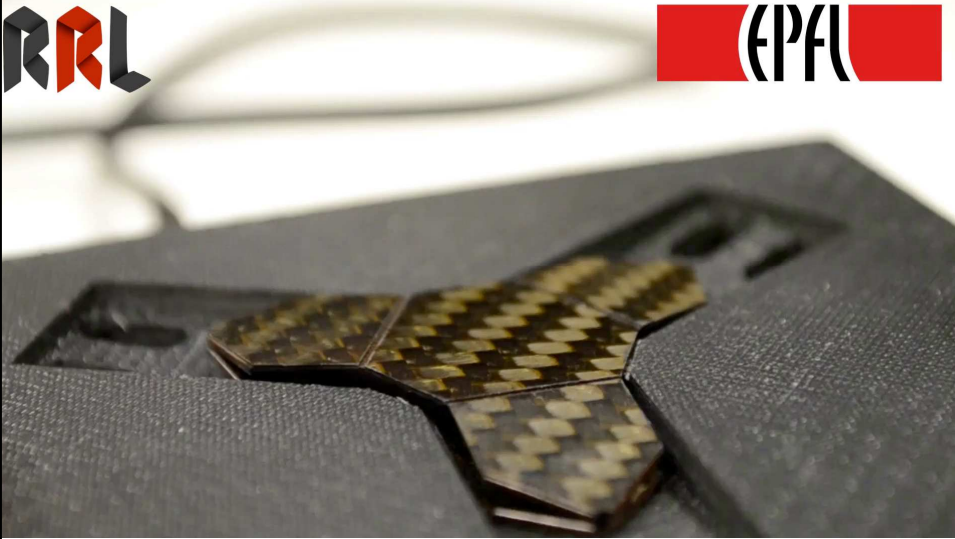
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Paik, *Nature Reviews Materials* (2018)
Zhakypov & Paik, *IEEE Trans. on Robotics* (2018)

RRR

Applications : Foldable Haptic Joystick

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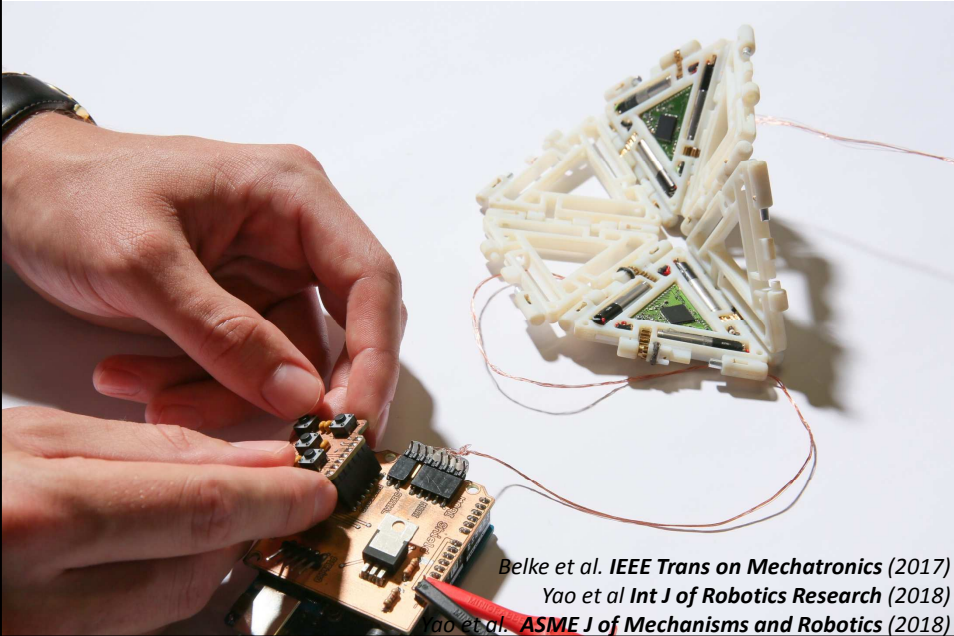
FOLDAWAY
haptics

US Patent 15/229,157
Best Demo Award *IEEE Haptics Symposium* (2018)
Salerno et al. *Sensors & Actuators* (2017)
Salerno et al. *J of Mechanisms & Robotics* (2017)

RRR

MORI – Modular ORlgami Robot

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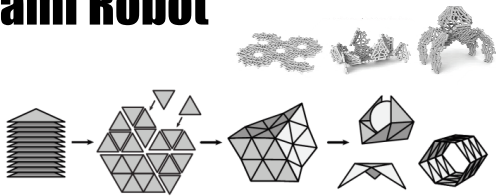


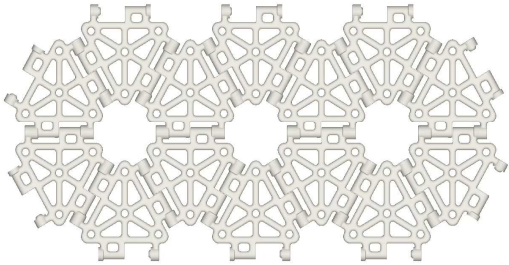
Belke et al. *IEEE Trans on Mechatronics* (2017)
 Yao et al. *Int J of Robotics Research* (2018)
 Yao et al. *ASME J of Mechanisms and Robotics* (2018)

MORI – Modular ORlgami Robot

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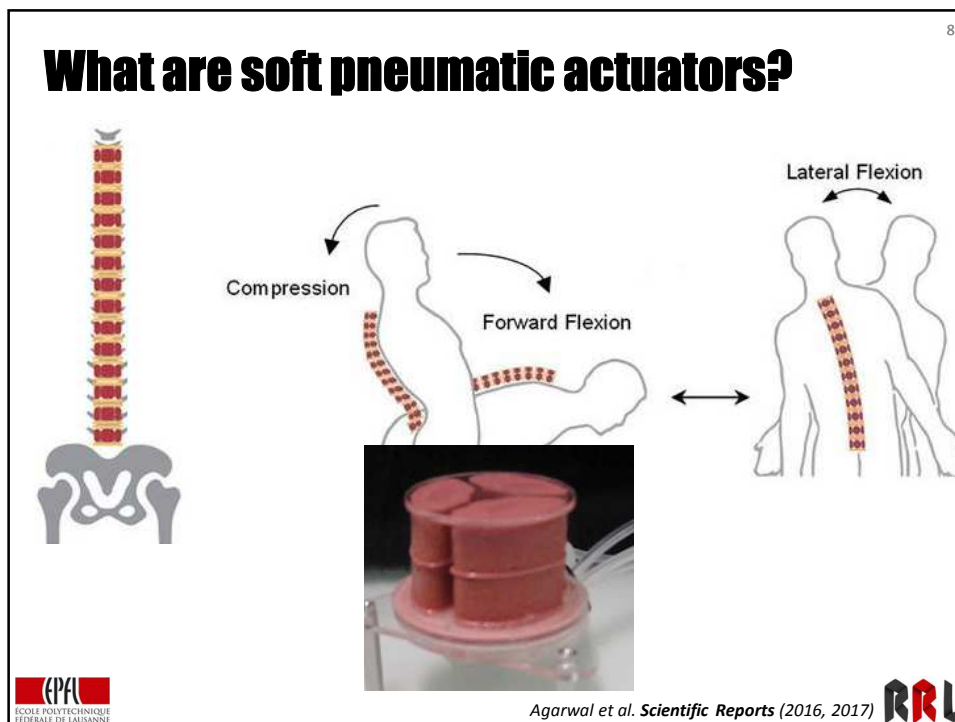
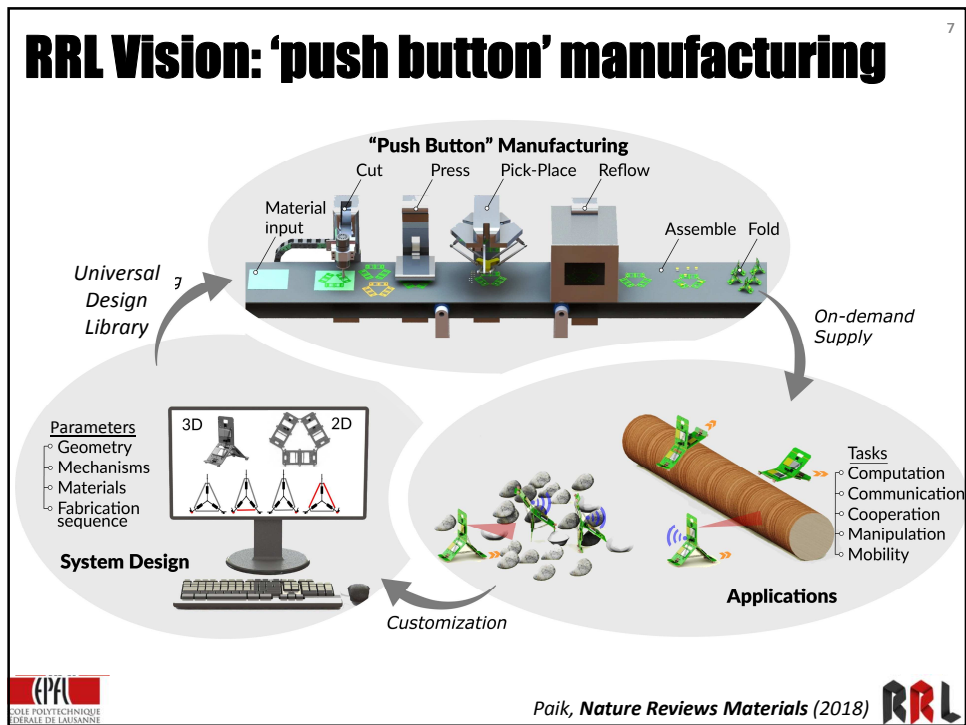
- quasi-2D modular robot
- folds like origami
- adapts to environments, objects, and tasks





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MORI



Portable vest for force assistance

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a.) The soft robotic vest.
Actuators marked 1-6



Compressor +
battery in the
backpack

Pressure
reservoirs

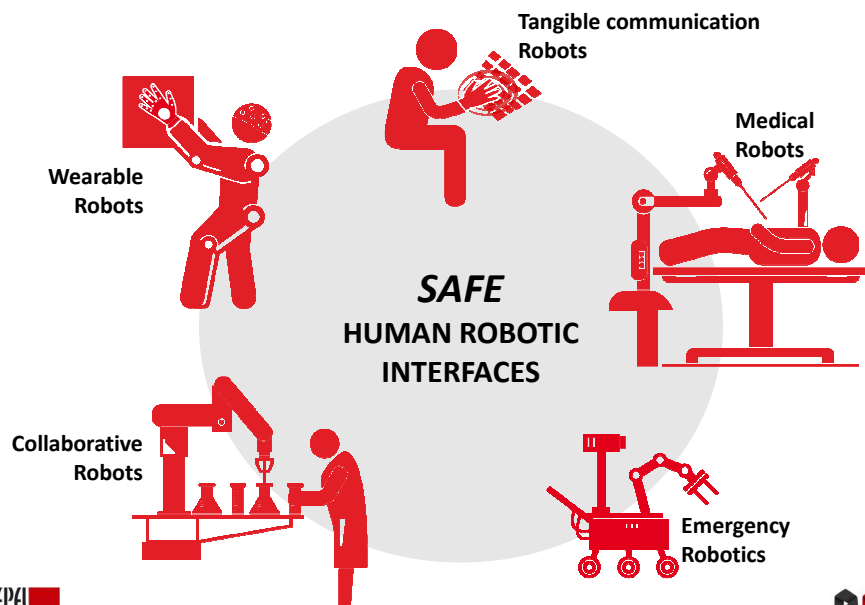
Flexible exo-
spine

b.) Portable pneumatic supply system
for powering wearable soft robots



Soft Robotic Applications

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RRL Members & Fundings

robotics+ Swiss National Centre of Competence in Research
 f oculus Strategic Focus Area Advanced Manufacturing
 esa swiss space cent Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra
 FLAG-ERA FNSNF VENTURE KICK EPFL INNOGRANTS enable

PhDs 11
 PostDocs

Origami Robots

Soft-Material Robots

Design Methodology & Model

Novel actuators & Control

Integration & Fabrication

Alumni

Assist. Prof. Acer @ Istanbul Technical Univ.
 Assist. Prof. Song @ Missouri State Univ.
 Assist. Prof. Fomin @ Siberian State Univ.
 Dr. Florez, Senior R&D engineer @ Liebherr
 Dr. Agarwal, Senior R&D researcher @ Tesla
 Dr. Firouzeh, PostDoc @ SNU