

## SOFT ROBOTICS: STATE OF ART AND OUTLOOK

Attila Mészáros<sup>1</sup>, József Sárosi<sup>2</sup>

Department of Mechatronics and Automation, Faculty of Engineering, University of Szeged,  
Moszkvai krt. 9. 6725 Szeged, Hungary

m-attila@mk.u-szeged.hu

### ABSTRACT

Widely used robot systems have a rigid base structure that limits the interaction with their environment. Due to the inflexible attachment points, conventional robotic structures can only manipulate objects with their special gripping system. It can be difficult for these systems to grasp objects with different shapes, handle complex surfaces or navigating in a heavily crowded environment. Many of the species observed in nature, like octopuses are able to perform complex sequences of movements using their soft-structured limbs, which are made up entirely of muscle and connective tissue. Researchers have been inspired to design and build robots based on these soft biological systems. Thanks to the soft structure and high degree of freedom, these soft robots can be used for tasks that would be extremely difficult to perform with traditional robot manipulators. This article discusses the capabilities and usability of soft robots, reviews the state of the art, and outlines the challenges in designing, modeling, manufacturing, and controlling.

*Keywords: soft robotics, soft actuators, bio-inspired robots, pneu-net, flexible robots*