

名城大学国際化推進センター主催

# The 4th Meijo Science Technology Seminar

日時：平成26年10月14日（火）15:30-16:30

場所：名城大学天白キャンパス研究実験棟Ⅱ2階K261多目的室

タイトル：“Soft Robotics” – the next generation of intelligent machines

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## Abstract

Researchers from robotics and artificial intelligence increasingly agree that ideas from biology and self-organization can strongly benefit the design of autonomous robots. Biological organisms which are for the better part built from soft materials, have evolved to perform and survive in a world characterized by rapid changes, high uncertainty, indefinite richness, and limited availability of information. The term "Soft Robotics" designates a new generation of robots capable of functioning in the real world by capitalizing on "soft" designs at various levels:

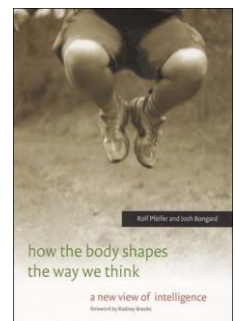
surface (skin), movement mechanisms (muscles, tendons), and interaction with other agents (smooth, friendly interaction). Industrial robots, in contrast, operate in highly controlled environments with no or very little uncertainty. By "outsourcing" functionality to morphological and material characteristics - e.g. to the elasticity of the muscle-tendon system - the distinction between control and to-be-controlled, which is at the heart of manufacturing and control theory, breaks down and entirely new concepts will be required. In this lecture I will argue that the next generation of intelligent machines – robots – will be of the “soft” kind and I will explore the theoretical and practical implications, whose importance can hardly be over-estimated. I will be using many examples and case studies. In particular I will be introducing the tendon-driven “soft” robot “Roboy” and conclude with some “lessons learned”.



## Short Bio

Rolf Pfeifer has a master's degree in physics and mathematics and a Ph.D. in computer science (1979) from the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. From 1987-2014 he was professor of computer science at the University of Zurich and director of the Artificial Intelligence Laboratory. He is currently a “Specially Appointed Professor” at Osaka University, Japan.

He is a pioneer of the fields of “embodied intelligence” and “soft robotics.” His book “How the body shapes the way we think” has been published in English, Japanese, Chinese, Arabic, and French.



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