

環境調和ロボット

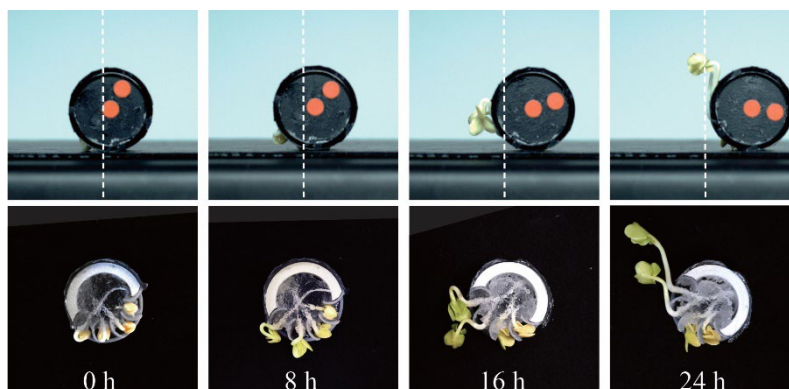
(電通大院情報理工) ○新竹 純

Environmentally Harmonized Robots (*Graduate School of Informatics and Engineering, The University of Electro-Communications*) ○Jun Shintake

This presentation explains, with specific examples, how considering the composition of robots at the material level can lead to the development of systems that are more harmonized with the external environment. Specifically, it introduces a swimming fish robot that interacts with the surrounding environment through structural compliance¹⁾, biodegradable robots that naturally decompose back into the natural environment^{2,3)}, and plant-based robots as an extension of these concepts⁴⁾.

Keywords : *Soft Robotics; Degradable Robots; Plant Robots; Underwater Robots; Environmentally Harmonized Robotics*

本発表では、ロボットの構成を材料レベルから検討することで、環境により調和したシステムが実現できることを実例とともに説明する。具体的には、構造の柔らかさによって環境と相互作用し遊泳する魚ロボット¹⁾、分解性によって自然に還るロボット^{2,3)}、そしてその延長としての植物ロボット^{4,5)}について説明する。



1) Soft biomimetic fish robot made of dielectric elastomer actuators. J. Shintake, V. Cacucciolo, H. Shea, D. Floreano, *Soft Robot.* **2018**, 5, 466. 2) Biodegradable electrohydraulic soft actuators. R. Kanno, F. Caruso, K. Takai, Y. Piskarev, V. Cacucciolo, J. Shintake, *Adv. Intell. Syst.* **2023**, 5, 2200239. 3) Biodegradable dielectric elastomer actuators and sensors. K. Takai, K. Murakami, J. Shintake, *IEEE robot. autom. lett.* **2024**, 9, 11730. 4) Plant robots: harnessing growth actuation of plants for locomotion and object manipulation. K. Murakami, M. Sato, M. Kubota, J. Shintake, *Adv. Sci.* **2024**, 11, 2405549. 5) Plant mobile robot using *Mimosa pudica*. M. Sato, K. Murakami, T. Ishizaka, A. Sato, Y. Tanaka, J. Shintake, *IEEE robot. autom. lett.* **2024**, 10, 32.