

INVITED LECTURE ON SOFT ACTUATORS

Date: 26 October 2010

Time: 1430 – 1600

Venue: P03 – Level 4 (Video Conference Room)

by



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He received his Doctor of Engineering degree in 2007. From 2004 to 2007, during his doctor course studentship, he was an active research fellow of Japan Society for the Promotion of Science. Since 2007 till now he is an assistant professor at Okayama University. His current research interests are soft actuators and their applications. These researches are supported by Ministry of Education, Culture, Sports, Science and Technology, Japan.

Abstract: Soft Mechanical System

When the term “Mechanical System” is mentioned, immediately we will visualize a robot, an automobile, an airplane and many others. Generally, mechanical system is configured with many rigid parts. These conventional mechanical systems having numerous rigid parts strongly support industrial activities and our daily life.

On the other hand, currently there are increasing needs for mechanical systems to handle fragile objects in medical, biological, agriculture fields and so on. These mechanisms must ensure “high safety”, since their contacts with human being, biological tissue, fruits, etc are direct and physical. Therefore safety from controlling is insufficient, hence it must be realized from “hardware”.

Presently, we have developed “Soft Mechanical Systems”, consisting only soft materials. Evidently, these systems can ensure true safety mechanically without the need for special controls. However, focus has to be on “Soft Actuator”, which is the most important element of dynamic mechanical systems and due to its nonlinear property material, it is the most difficult element to realize. Our research group had developed some novel soft actuators using nonlinear finite element method and has applied them to mechanical systems.

In my coming lecture, I will mainly speak about and show our novel soft actuators developed by our research team, including design method, fabrication process and their motions. To ensure better understanding of our work, some of the soft actuator applications will be also explained. Additionally, I will also introduce our laboratory where many interesting researches on actuators were and are currently conducted, not only limited to soft actuators but also expands to several other kinds of actuators and their applications.

Awards:

Presentation Encouraging Award from Machine Design & Tribology Division of the Japan Society of Mechanical Engineers in 2005

Dean Award from Graduate School of Natural Science and Technology, Okayama University in 2007

Excellent Presentation Award from System Integration Division of the Society of Instrument and Control Engineers in 2008