

## **Challenge and future trends of the robotic technology**

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### **Abstract:**

Robotic technology has been making remarkable progress in many fields of our daily life, such as safety, security and health. Micro and nano robotic technology is furthermore necessary to improve the higher accuracy and sensitivity as well as reducing the cost and material consumptions, including the energy saving. Thus, it is expected to play an important role in the green and life innovations. This lecture describes such innovative challenges in many fields by robotic technology, such as environmental robotics applications, bio-medical robotic applications, life supporting applications for the aging society in the future.



### **CV:**

Toshio Fukuda graduated from Waseda University, Tokyo, Japan in 1971 and received the Master of Engineering degree and the Doctor of Engineering degree both from the University of Tokyo, in 1973 and 1977, respectively.

He joined the National Mechanical Engineering Laboratory in Japan in 1977, the Science University of Tokyo in 1981, and then joined Department of Mechanical Engineering, Nagoya University, Japan in 1989.

At present, he is Professor of Dept. of Micro and Nano System Engineering and Dept. of Mechano-Informatics and Systems, Nagoya University, Japan. He is director of Center for Micro and Nano Mechatronics. He is mainly engaging in the research fields of intelligent robotic system, micro and nano robotics, bio-robotic system, and technical diagnosis and error recovery system.

He was the President of IEEE Robotics and Automation Society (1998-1999), Director of the IEEE Division X, Systems and Control (2001-2002), the Founding President of IEEE Nanotechnology Council (2002-2005), and Region 10 Director-elect (2011-2012). He was Editor-in-Chief of IEEE/ASME Trans.

Mechatronics (2000-2002).

He was the Founding General Chairman of IEEE International Conference on Intelligent Robots and Systems (IROS) held in Tokyo (1988). He was Founding Chair of the IEEE Workshop on Advanced Robotics Technology and Social Impacts (ARSO, 2005), Founding Chair of the IEEE Workshop on System Integration Internatioal (SII, 2008), Founding Chair of the International Symposium on Micro-Nano Mechatronics and Human Science (MHS, 1990-2011).

He has received many awards such as IEEE Eugene Mittelmann Achievement Award (1997), IEEE Third Millennium Medal (2000) , IEEE Robotics and Automation Pioneer Award (2004), IEEE Transaction Automation Science and Engineering Googol Best New Application Paper Award (2007), George Saridis Leadership Award in Robotics and Automation (2009), IEEE Robotics and Automation Technical Field Award (2010). IEEE Fellow (1995). SICE Fellow (1995). JSME Fellow (2002), RSJ Fellow (2004), VRSJ Fellow (2011) and member of Science Council of Japan (2008- ).