Abstract for 03 November 2018, Taoyuan, Taiwan

Development of Advanced Practical Robotics

Prof. Ikuo Yamamoto

Nagasaki University, Japan

This will be an introduction to the theory and procedures involved in designing and developing advanced practical robotics and mechatronics. Particularly, advances in robotics and mechatronics for marine, aviation, space, and medicine are described to promote creation of new technologies in order to prepare society for future sustainability. Research and development of remotely operated underwater vehicles (ROV), autonomous underwater vehicles (AUV), multi-rotor aviation robots (drones), and life-like swimming robotic fish (seabream, sea ray, dolphin, etc.) are referred to in the presentation. Also, new medical instruments based on robotic fish technologies and a wrist rehabilitation robot for patients which have proven to be useful in the medical field are explained. In addition, a rapid red tide inspection system for fish farms using a drone & AI is introduced. Finally, industrial cluster construction of an offshore energy system using robotics in Nagasaki is outlined.

Sea bream robotic fish

Robotic dolphin

Remotely Operated Vehicle

Experience:

Dr. Ikuo Yamamoto is Professor of the Graduate School and Director of Division of Marine Energy Utilisation, Organization for Marine Science and Technology at Nagasaki University in Japan. His areas of work include the development of Autonomous Underwater Vehicle (Leader of AUV “Urashima”, which established a world record for autonomous cruising in February 2005), Remotely Operated Vehicle (Champion in underwater vehicle competition of Techno ocean world convention in 2012 and Okinawa offshore robotics contest in 2014, 2015, 2016; “Kaiko”, 10000m deep cruising in 1995), Robotic fish (the first life-like sea bream robotic fish was created in 1995, followed by a dolphin, sea ray ,coelacanth, carp, etc.).

Professor Yamamoto received the B.E. degree in aeronautic Engineering, M.Eng.Sc. degree in applied mechanics in 1983, 1985, respectively, and the Dr. Eng. Degree in 1994 from Kyushu University, Japan and became Professor at Kyushu University in 2005, University of Kitakyushu in 2007, and Nagasaki University, Japan in 2013. Also, he held the post of Research Manager at Mitsubishi Heavy Industries where he was involved in projects which included the manufacture of the wings for the Boeing 787, high speed cruising ship, DPS of offshore platform, intelligent ship from 1985 to 2004 and the leader of Autonomous Underwater Vehicle Group of JAMSTEC from 2004 to 2007. His robotic space fish was

operated in the International Space Station in 2009 and he has worked on medical robots and instruments used for surgery and rehabilitation based on biological engineering technologies. He has published over 300 papers, books, patents, and has won several awards at international conferences. Also, he also received as a GlobalScot award from the Scotland government in 2017.