

# EME International Seminar Series



## Introduction to sports engineering ~ research of swimming as an example

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### Abstract:

This lecture aims to introduce postgraduate students to sports engineering, which has been developing recently as an interdisciplinary research field. As an example of this area, research works related to swimming in our laboratory will be introduced. We firstly developed a simulation model of human swimming about 20 years ago. This model, named “SWUM,” has been utilized for analyses of various targets, such as four strokes, dolphin kick, lift in artistic swimming, fin swimming and para swimming. The swimming humanoid robot “SWUMANOID,” which was developed by us as an alternative experimental platform for research of swimming, will be introduced as well.

### Bio:

Professor Motomu Nakashima is Professor of Systems and Control Engineering at Tokyo Institute of Technology, Japan. He graduated in Mechanical Engineering at Tokyo Institute of Technology in 1990 and received the Ph.D. in Mechanical Engineering from Tokyo Institute of Technology in 1995. From 1995 to 2002 he was Research Associate in Mechanical Engineering at Tokyo Institute of Technology. From 2002 to 2014 he was Associate Professor at Tokyo Institute of Technology. From 2014 he is Professor at Tokyo Institute of Technology. From August 2001 to July 2002 he was visiting researcher at Naval Postgraduate School in Monterey, USA. His research interests are sports engineering, biomechanics, biorobotics and welfare engineering. He is currently working on development of a simulation model for human swimming and its application to various fields. He was President of the Society of Aero Aqua Bio-mechanisms. He was Chair of National Research and Development Project for Paralympic Top Athletes. He is Editor of Journal of Biomechanical Science and Engineering, Sports Engineering, and Journal of Sports Engineering and Technology. He is Fellow of Japan Society of Mechanical Engineers and International Sports Engineering Association.

For more information, please see his personal page:

[http://www.hei.sc.e.titech.ac.jp/nakashima\\_lab/motomu/index2.html](http://www.hei.sc.e.titech.ac.jp/nakashima_lab/motomu/index2.html)

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Online (Microsoft Teams, Team code: qwa2twu)