Invited Speakers

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| C:\Users\AROB2012\Desktop\Jovic_photo1.jpg  **Short biography:**  Jovana Jovic finished School of Electrical Engineering, University of Belgrade, Serbia in 2006. From 2006 till 2009 she has been working as a part of research group for Biomedical Instrumentation and Technologies, Belgrade, Serbia. She received her PhD degree in automatic control and robotics in 2012 from University of Montpellier II. From 2012 till 2013 she worked as post-doc researcher in DEMAR research group at Montpellier Laboratory for Informatics, Microelectronics and Robotics (LIRMM), France. She joined the AIST JRL laboratory in 2013. Her research interests include robotics control, movement analysis, humanoid robotics, biomedical engineering, and biomechanics. |  | **Title: Identifying humanoid and human physi cal parameters**  **Abstract:**  Dynamical and kinematic analysis of humanoid and human movements require accurate estimation of segment mass parameters (mass, center of mass, and inertia matrix), and their misinterpretation can lead to significant variation in estimated joint kinematics. Commonly used method for mass parameters estimations in human subjects is based on scaling equations developed from direct measurements from cadavers of elderly Caucasian males. However, fluid and tissue loss in segmentation, and different properties of living and deceased tissue, can affect the accuracy of estimated parameters. Moreover, extrapolation those data to different population is restrictive due to the different body morphologies. Subject specific measurement of mass parameters on living humans is possible using medical imagining technologies, such as gamma-ray scanning, computed tomography imaging, and magnetic resonance imaging technology. Those techniques are not widely used due to cost of the method, labor time during data processing, limited accessibility and exposure of subjects to radiation. In case of humanoid robots, robot designers often give mass parameters values obtained by CAD software. It is common that the data given by CAD are only rough approximation of the true parameters, and they do not take into account possible robot modifications. Moreover, modeling robots using CAD data usually includes undesirable errors such as wiring materials. In the field of robotics, several methods have been developed for estimation of mass parameters of humanoid robots, as well as human subjects, based on linear properties of dynamic equation of bipedal systems with respect to the set of mass parameters. This talk will focus on those methods addressing the state-of-the-art research in the topic. The presentation will provide examples of both human and humanoid robots mass parameters estimation. Identified mass parameters improve output of human dynamic analysis and humanoid simulation and model-based control. |