Ugur, E., Nagai, Y., Oztop, E., and Asada, M. (Eds) Proceedings of
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Invited Talk II

Developmental Approach to Robotic Intelligence

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Abstract: This talk will focus on recent research results that show how a robot can solve multiple tasks based on what it learns during a developmental period similar to a childs play. During this period the robot actively tries to grasp, lift, shake, touch, scratch, tap, push, drop, and crush objects. At the end of this period the robot knows what different objects sound like when they are dropped, feel like when they are squeezed, etc. Because these properties are grounded in the robots sensorimotor repertoire the robot can autonomously learn, test, and verify its own representations without human intervention. The talk will demonstrate how the robot can use this information to recognize objects, separate objects into functional categories, and even find the odd-one-out in a set of objects. The talk will also demonstrate how the robot can use sensorimotor interactions to bootstrap the development of its visual system in the context of a button-pressing task. Results and videos will be presented for two different humanoid platforms.

Speaker Bio: Dr. Alexander Stoytchev is an Assistant Professor of Electrical and Computer Engineering and the Director of the Developmental Robotics Laboratory at Iowa State University, USA. He received his MS and PhD degrees in computer science from the Georgia Institute of Technology in 2001 and 2007, respectively. His research interests are in the areas of developmental robotics, autonomous robotics, computational perception, and machine learning.