ABSTRACT OF THE TALK

Skillful and goal-directed interaction with a dynamically changing world is among the hallmarks of human perception and motor control. Understanding the mechanisms of such skills and how they are learned is a long standing question in both neuroscience and technology. This talk develops a general framework of how motor skills can be learned. At the heart of our work is a general representation of motor skills in terms of movement primitives as nonlinear attractor systems, the ability to generalize a motor skill to novel situations and to adjust it to sudden perturbations, and the ability to employ imitation learning, trial-and-error learning, and model-based learning to improve planning and control of a motor skill. Our framework has close connections to known phenomena in behavioral and neurosciences. We evaluate our approach in various studies with anthropomorphic and humanoid robots.