

## **Kolloquium „Berner Gespräche zur Sportwissenschaft“**

Monday, 11.03.2024

4.15pm - 5.45pm

University of Bern, ZSSw building C, room C001, Bremgartenstr. 145, 3012 Bern

### **Toward the study of complex motor skills using modularity and virtual reality**

Motor control research has traditionally focused on simple motor tasks that can be easily controlled and analyzed. Only recently researchers in the field have started addressing more complex motor skills to gain deeper insights into the interplay between perception, cognition, and movement production, which characterizes our daily naturalistic motor behavior.

In this talk we will discuss recent advances in the attempt to shift from the study of simple movements to the study of complex motor skills. We will discuss how the idea of modular control through the combination of muscle synergies originally applied to simple motor tasks may also provide a principled approach and inspire the development of novel methods to study complex motor skills. We will present a series of studies in which we use modular decomposition of kinematic data, and we exploit the unique opportunities of immersive VR technologies, to systematically investigate naturalistic interactive throwing and catching. This line of work shows how it is possible to accurately describe whole-body actions in low dimensional spaces, and thus to quantitatively characterize aspects of complex motor behavior such as individual styles and shared strategies, action predictability, and the role of prediction in motor performance.

### **Andrea d'Avella, Antonella Maselli**



Andrea d'Avella has an MSc in Physics and a PhD in Neuroscience and is a professor of Physiology at University of Rome Tor Vergata. His research focuses on the modular organization of motor control and motor learning.

Antonella Maselli has a background in Physics and is a researcher at the Institute of Cognitive Sciences and Technology in Rome. Her research focuses on motor control, self-body processing, and embodied decision-making.