

## **Motor and perception-based prediction**

**Alessandra Sciutti<sup>1,2</sup>, Francesco Nori<sup>1</sup>, Giorgio Metta<sup>1,2</sup>, Thierry Pozzo<sup>1,3,4</sup> and Giulio Sandini<sup>1</sup>**

1. Istituto Italiano di Tecnologia, via Morego 30, 16163 Genoa, Italy
2. Dipartimento di Informatica Sistemistica e Telematica, Via all'Opera Pia 13, 16145 Genoa, Italy
3. INSERM, U887, Motricité-Plasticité, Dijon, F-21078, France.
4. Université de Bourgogne, Dijon, Campus Universitaire, UFR STAPS, BP 27877, F-21078 Dijon, France

In this study we investigated whether prediction is differently realized when it's aimed at "driving a motor act" and when instead its purpose is "perceptual-only". In particular we focused on how dynamical information of target motion is used depending on prediction goal. In a first experiment a ball disappeared behind an occlusion after following parabolic paths. To analyze the "driving a motor act" condition we asked subjects to move their arm to intercept the ball. In a second experiment we investigated the "perceptual-only" condition by repeating a similar task but requiring only a perceptual evaluation. Subjects had to select (in 2AFC protocol) where the ball would have arrived after the occlusion. Performances in both experiments were measured in two conditions (1) ball driven by a constant force field and (2) by a variable force field. Results showed that while ball dynamics stability facilitates interception, it doesn't affect perceptual assessment. The dynamic visual information seems therefore to be processed differently when its purpose is a motor act versus a perceptual one.