

# Visual object recognition by prehension movement

Francesco Campanella<sup>1,2</sup>, Giulio Sandini<sup>1,2</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

## Abstract

Object motor representation is strictly linked to prehension movements control. In particular the influence of some visual intrinsic object features on hand preshaping during reach to grasp movements is known. In this study we propose a new paradigm to investigate human skill in object features extraction from visually presented actions. We measured the performance of subjects in the recognition of objects by looking at videos of prehension actions obtained by showing only point-light based representations of the grasping hand. Subjects were required to recognize the object with different procedures and different experimental conditions were considered. Performance analysis suggests how spatial information of object directed actions varies in time. Furthermore these experiments could provide new insights about the problem of agency in the domain of hand biological motion perception. In our preliminary results recognition errors seem not to be casually distributed among simple objects and response distribution supports the idea that the action of grasping an object encodes information about the shape and size of the object. Moreover performance in object recognition is affected by the perspective from which subjects looked at recorded grasping movements, and this effect is mainly present when subjects were shown their own previously recorded actions.