



## Vision Research special issue on “Perception and action”

This is the first of two parts of a special issue on the topic of “Perception and action”. The papers presented in this special issue are based on a workshop on the topic that took place in June 2010 at Rauischholzhausen Castle near Giessen in Germany. It was organized by the research group “Perception and action” at the universities of Giessen and Marburg, which is sponsored by a grant from the Deutsche Forschungsgemeinschaft (FOR 560). Further funding for the workshop was provided by the Alexander-von-Humboldt-Foundation in the form of a TransCoop grant to Katja Fiehler (Marburg) and Denise Henriques (York).

In the past, sensory and motor functions were usually investigated separately. This approach was based on the 19th century discovery of distinct cortical regions for sensory signal processing and motor control. In recent years, several lines of research have invigorated the interest to specifically look at the relationship between these two systems.

First, it has become increasingly clear that even the earliest stages of visual processing are affected by the movements of our eyes and our body. There is no simple processing pipeline from perception to action, but a continuous action–perception loop. Active perception denotes the idea that we sense our environment actively to maximize information about the world.

Second, one of the most discussed findings of the past decades, the discovery of mirror neurons in the premotor cortex of monkeys, suggests that perception and motor control are intricately related. Such neurons are equally responsive to the monkey's own actions, as well as to the observation of identical actions of other actors. While it is still under debate how far reaching the implications of these findings are, it is quite clear that they imply a very tight relationship between perception and action.

The third and final reason why the study of perception and action has been so intense in recent years comes from the opposite side of arguments. Based on findings in neuropsychological patients, David Milner and Melvyn Goodale have proposed that there are two separate visual pathways, one for conscious perception and the other for action. This rather bold suggestion has motivated a tremendous amount of research to investigate the question on the relationship between visual signals for action and perception specifically. While the jury is still out on this issue in general, some of the debate is part of this issue, including arguments in favor and against the idea of two separate visual pathways.

The articles in this issue will help understand the interface between sensory and motor processing, which is crucial for our interactions with the environment. Sensorimotor malfunction is a major, debilitating feature of many neurological disorders, including strokes, tumors, injury, and degenerative disease.

We hope that the articles in this special issue can reflect some of the excitement of the workshop!

### Acknowledgments

We are grateful to the Deutsche Forschungsgemeinschaft (DFG) and the Alexander-von-Humboldt-Stiftung for their financial support and to Vision Research for publishing this special issue.

*Workshop organizer and Special Issue Editor*

Karl Gegenfurtner

*Department of Psychology, Giessen University, Germany*

*E-mail address: [karl.gegenfurtner@psychol.uni-giessen.de](mailto:karl.gegenfurtner@psychol.uni-giessen.de)*

*Workshop organizer*

Frank Bremmer

*Department of Physics, Marburg University, Germany*

*E-mail address: [frank.bremmer@physik.uni-marburg.de](mailto:frank.bremmer@physik.uni-marburg.de)*

*Workshop organizer*

Katja Fiehler

*Department of Psychology, Marburg University, Germany*

*E-mail address: [fiehler@staff.uni-marburg.de](mailto:fiehler@staff.uni-marburg.de)*

*Special issue editor*

Denise Henriques

*School of Kinesiology and Health Science, York University, Canada*

*E-mail address: [deniseh@yorku.ca](mailto:deniseh@yorku.ca)*

*Special issue editor*

Richard Krauzlis

*SALK Institute, La Jolla, USA*

*E-mail address: [rich@salk.edu](mailto:rich@salk.edu)*