



PARTNERSHIP



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PROJECT INFORMATION

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Contract number: **FP7-248366**

Start date: **December 1, 2009**

Project duration: **36 months**

Activities codes: **ICT-2009.2.1**
**Challenge 2: "Cognitive Systems,
Interaction and Robotics"**

Project cost: **2.163.237 €**

EC contribution: **1.659.000 €**

The RoboSoM project involves four partners
from: Italy, France, Portugal, Japan

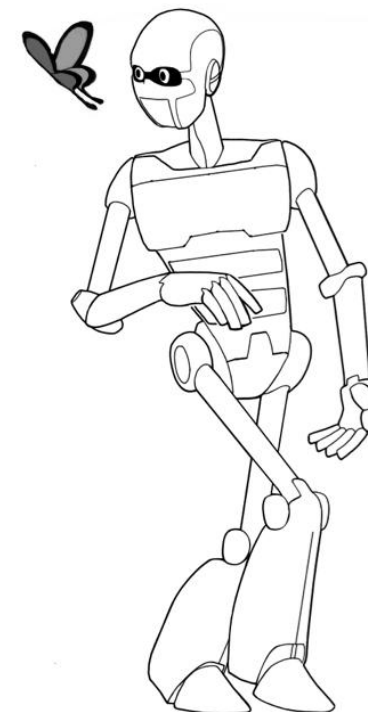


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RoboSoM

A ROBOTIC SENSE OF MOVEMENT

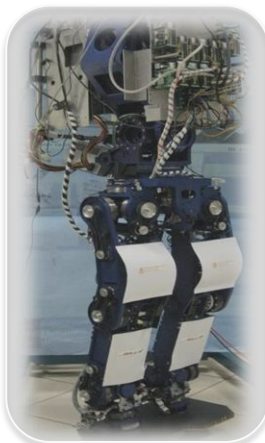


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OBJECTIVES

RoboSoM aims at **the study and robotic implementation of a model of the sense of movement**, that endows a humanoid robot with advanced perception and action capabilities in biped locomotion, based on a unified inertial reference frame and on predictive behavior.

This implementation in a very advanced humanoid robot will lead to enhanced performance in the real world, in terms of capability of accomplishing practical and helpful tasks.

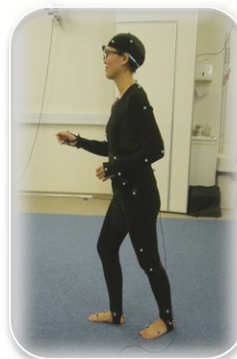


THE SENSE OF MOVEMENT

Two main ideas relate to the concept of sense of movement:

1. the integration of a variety of sensory signals, mostly proprioceptive: the brain uses this information to generate a **unified inertial reference frame**, centred in the head, that allows whole-body coordinated movements and head-oriented locomotion;
2. in humans, perception is not just the interpretation of sensory signals, but a **prediction** of consequences of actions. Perception can be defined as a *simulated action*: perceptual activity is not confined to the interpretation of sensory information but it anticipates the consequences of action (**Expected Perception**).

MODELS OF GAZE-GUIDED LOCOMOTION TRAJECTORIES



Neuroscientists and mathematicians design the **experiments** to perform on **human locomotion**, based on the current relevant advances and the knowledge needed in Robotics and Neuroscience research.

The **scientific objective** is to validate the new and extended model of whole-body coordination in human walking.

The methodology of the human experiments used to capture locomotor path and gaze movements will require VICON motion system and eye tracker system.

Exchanges between neuroscience and robotics are the **key point** of the human model integration to the **RoboSoM system**.

EXPECTED RESULTS

The final objective of the RoboSoM project is the **integration of the visual apparatus** in the robotic biped platform, able to execute head stabilization during locomotion, and the **implementation of the human-gaze guided locomotion model**.

The robot will be able to:

- straight walk to reach a visual target, also with obstacles avoidance
- follow a moving target
- free walk in different and unknowing environment.

