Intelligent observation and execution of Actions and manipulations

Fact Sheet

Project Information

IntellAct
Grant agreement ID: 269959

Funded under
FP7-ICT

Overall budget
€ 3 899 781

EU contribution
€ 2 959 592

Coordinated by
SYDDANSK UNIVERSITET
Denmark

Project description

Cognitive Systems and Robotics
understanding and exploiting the meaning (semantics) of manipulations in terms of objects, actions and their consequences for reproducing human actions with machines

IntellAct addresses the problem of understanding and exploiting the meaning (semantics) of manipulations in terms of objects, actions and their consequences for reproducing human actions with machines. This is in particular required for the interaction between humans and robots in which the robot has to understand the human action and then to transfer it to its own embodiment. IntellAct will provide means to allow for this transfer not by copying movements of the human but by
transferring the human action on a semantic level. Two major application areas are addressed by IntellAct: the monitoring of human manipulations for correctness and the efficient teaching of cognitive robots to perform manipulations in a wide variety of applications.

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The analysis of low-level observation data for semantic content (Learning) and the synthesis of concrete behaviour (Execution) constitute the major scientific challenge of IntellAct. Based on the semantic interpretation and description and enhanced with low-level trajectory data for grounding, two major application areas are addressed by IntellAct: First, the monitoring of human manipulations for correctness (e.g. for training or in high-risk scenarios) and second, the efficient teaching of cognitive robots to perform manipulations in a wide variety of applications. To achieve these goals, IntellAct brings together recent methods for (1) parsing scenes into spatio-temporal graphs and so-called „semantic Event Chains“, (2) probabilistic models of objects and their manipulation, (3) probabilistic rule learning, and (4) dynamic motion primitives for trainable and flexible descriptions of robotic motor behaviour. Its implementation employs a concurrent-engineering approach that includes virtual-reality-enhanced simulation as well as physical robots. Its goal culminates in the demonstration of a robot understanding, monitoring and reproducing human action.

**Fields of science**

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**Programme(s)**

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### Topic(s)

#### Call for proposal

FP7-ICT-2009-6

#### Funding Scheme

CP - Collaborative project (generic)

### Coordinator

**SYDDANSK UNIVERSITET**

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- **Activity type**: Higher or Secondary Education Establishments
- **EU contribution**: € 674 700

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