# IROMEC (Interactive Robotic Social Mediators as Companions)

## Type of Project

**Intervention**

## Summary

IROMEC (Interactive Robotic Social Mediators as Companions) is a modular mobile robotic platform developed in a three year project which started in November 2006. It was cofunded by
the European Commission within the RTD activities of the Strategic Objective SO 2.6.1 “Advanced Robotics” of the 6th Framework Programme (2006-2009).
It was designed to become a social mediator for children with different levels of impairments such as cognitive disabilities, severe motor impairments and autism.

## Low-tech, high-tech products, services and contexts for play

IROMEC is a mobile robotic platform designed to encourage disabled children to engage in social interaction via play scenarios. IROMEC is tailored towards children with autism, children with cognitive disabilities and children with motor impairments. The robot can engage in different play scenarios. The play scenarios were developed according to the needs of the target users group and according to the ICF-CY (International Classification of Functioning – version for Children and Youth) (Robins et al., 2010).
The main components of IROMEC are a mobile platform, an application module, a number of additional components that modify the appearance and behaviour of the robot (Marti et al., 2010). Each element of the visual interface was designed using only a few variations and basic geometric shapes according to the needs of the impaired children, which are its main target user group (Lehmann et al. 2011).
The robot is able to move in space autonomously and remotely controlled through a joy pad, or a button. IROMEC’s movements were designed not to be just functional in the interaction but also expressive in order to engage and sustain the children in the interaction. IROMEC is able to detect obstacles and persons in its surrounding through ultrasound and infrared sensors located on the mobile platform.

## The context of use

It is possible to use IROMEC in different context such as education and rehabilitation centres.

## Type of play in this play system

### Cognitive

| |
|---|
| Practice |
| Symbolic |
| Constructive |
| Rule play (including videogames) |

### Social

| |
|---|
| Associative |
| Cooperative |

## Objectives related to play according to ICF-CY

### Play for the sake of play: Major life areas - d880 enagement in play

| |
|---|
| d8802 parallel play |
| d8803 shared cooperative play |
| d8808 engagement in play, other specified |
| d8809 engagement in play, unspecified |

### Community social and civic life - d920 recreation and leisure time

| |
|---|
| d9200 play |

### Play-like activities: Therapeutic and educational objectives

| |
|---|
| b1 Mental functions |
| b2 Sensory functions and pain |
| d1 Learning and applying knowledge (learning through symbolic play, learning through pretend play) |
| d3 Communication |
| d4 Mobility |
| d7 Interpersonal interactions and relationships |

### Number of participants

| |
|---|
| 10-20 |

### Chronological Age

| |
|---|
| 6-12 years |

### LUDI Categories of disabilities

| |
|---|
| Mental/intellectual impairments:: |
| mild |
| moderate |
| Communication disorders (speech and language disorders): |
| Physical impairments: |
| Mild |
| Autism Spectrum Disorders: |
| Multiple disabilities: |

## Explanation on the use of low-tech, high-tech devices, services or contexts

### Explanation

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|---|
| Verbal instruction, language and communication is adapted |
| Visual and/or verbal instruction with AAC (Aumentative and Alternative Communication) |
| Visual instruction with pictures or drawings |
| Prompting: therapist/researcher touches the participant as a key for further actions |
| Modeling by peer |

### Involvement

| |
|---|
| Adult: therapist/educator/researcher |

| |
|---|
| Peer without disabilities |

## Role

| |
|---|
| Participatory observer |
| Providing instruction |

## Evaluation of objectives and outcome measures

### Description of outcome measure(s)

| |
|---|
| Observation by professional/researcher providing the play experience |
| Video analysis |
| Feedback from client/parents/professionals |
| (validated and reliable) outcome measures like tests, self-reports of client/system, questionnaires |

### Information about availability of outcome measure: publisher, website, contact person

www.roboticsandlearning.org

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## Summary of achieved effects

IROMEC robot seemed to have had a positive influence on the children's individual development.

IROMEC contributes to:
- help children to engange in play
- improve the social inclusion;
- facilitate the learning enviorment;
- facilitate the mediation child-human and child-child
- transfer some of the skills learned during the sessions with the robots

The use of IROMEC with children with ADHD and some traits of autism seems to be
advantageous due to its mobile characteristics, which facilitate the needs of children with this specific disorder more explicitly.

## References to the intervention or research project

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## Website

www.roboticsandlearning.org

## Publication

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## Keywords

IROMEC
Children
Autism
Cognitve Disabilities
Motor Disabilities
Play
Human-Robot Interaction