Task 7.1
Robots and Mathematical Cognition

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THINK&TALK Node

RobotDoC
Robotics for Development of Cognition

MARIE CURIE ACTIONS

Scientific Questions

- How do children learn numbers (abstract concepts) from highly variable perceptual stimuli?

- How does child's body support mathematical cognition (embodiment)

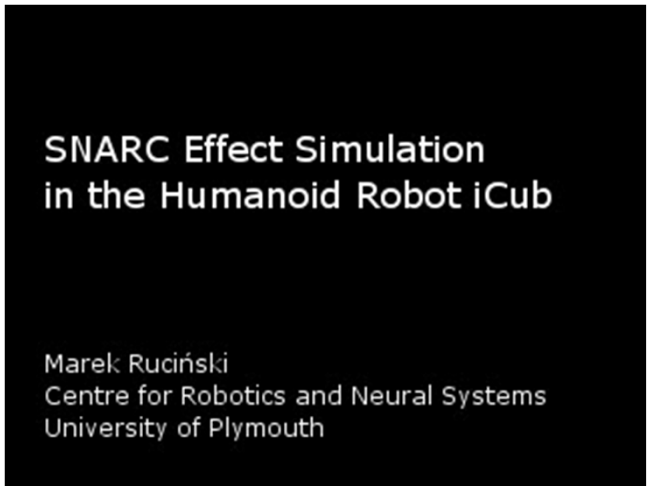
Scientific Questions

- **Robot able to** learn numbers (abstract concepts) from highly variable perceptual stimuli

- **Robotic** body support**s** mathematical cognition

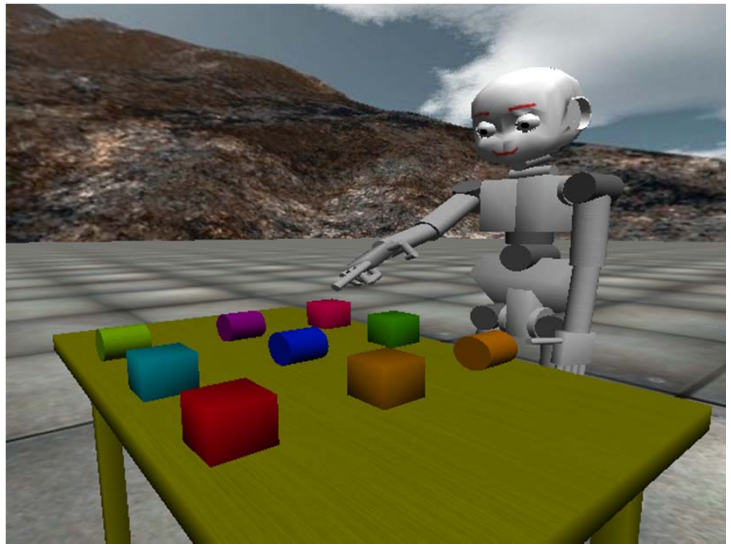
Number-space interactions in the iCub robot

- Embodiment: mapping reachable and visible space around the robot
- Emergence of interaction between number and space representations



Contribution of gesture in learning to count

- Robot points toward objects while counting
- Robot transfers motor knowledge to an abstract concept



Summary

Potential for the industry

- Numerical abilities of the robot acquired rather than pre-programmed: **learning**, **adaptivity**, **flexibility** and **scalability** in unpredictable environments
- Long-term: able to **acquire abstract concepts**, handle **ultra-vast** learning spaces