# Social Robotics – From Cognitive Science to Robots in the Real World

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# Citec - Cluster of Excellence: A Threefold Mission

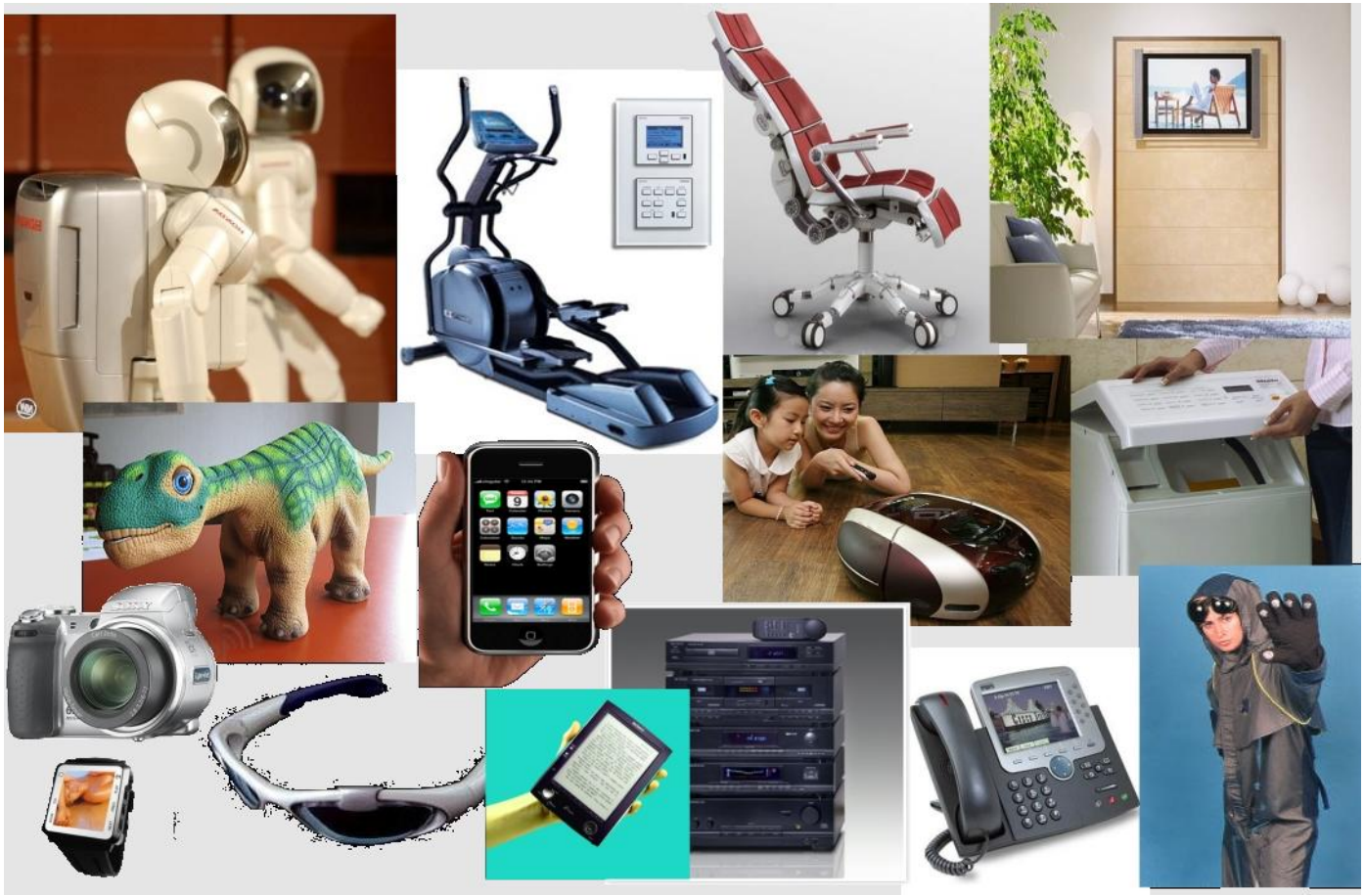
**Technology:**
Elevate the interaction with technical systems into the ease and naturalness of human communication

**Scientific:**
Gaining new insights into the principles and mechanisms of Cognitive Interaction

**Bridge cultures:**
Connect engineering and life sciences cultures to integrate technology into our daily lives

**Cognitive Interaction Technology (CIT)**

# What is CIT useful for?



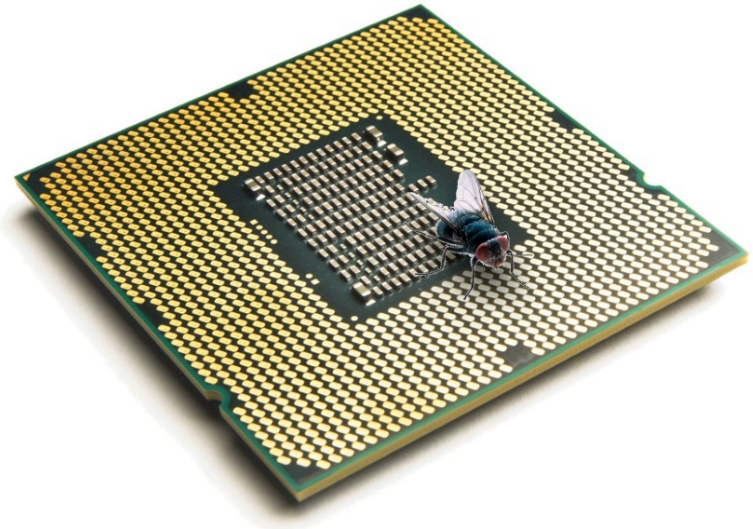
# New Paradigm Leading into Second Funding Period (2012-2017)

**Guiding Hypothesis:**

Cognitive Interaction Systems require **dynamic growth processes** instead of static construction from a "fixed blueprint"

Requires to gain **deep understanding** of:

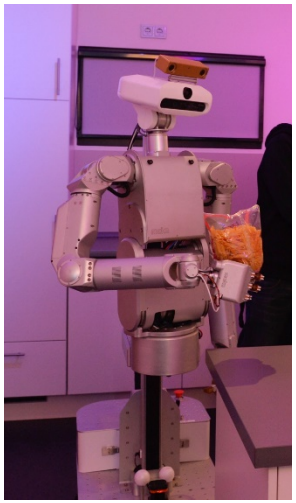
- Scaffolding mechanisms to guide and focus growth
- Adaptivity to keep systems responsive to change
- Resource sensitivity**:** limitation o resources leads to optimal solution

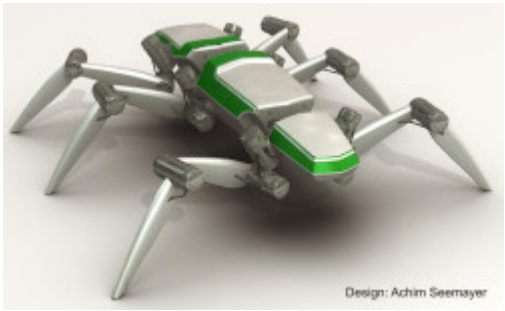


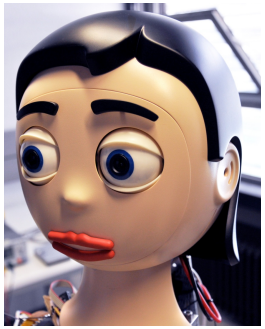
# New Citec Building

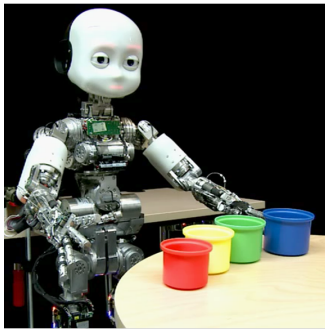

# Robots at Citec

- Mekabot
- Biron
- Hector
- Flobi
- iCub
- Nao
- Shadow Hand

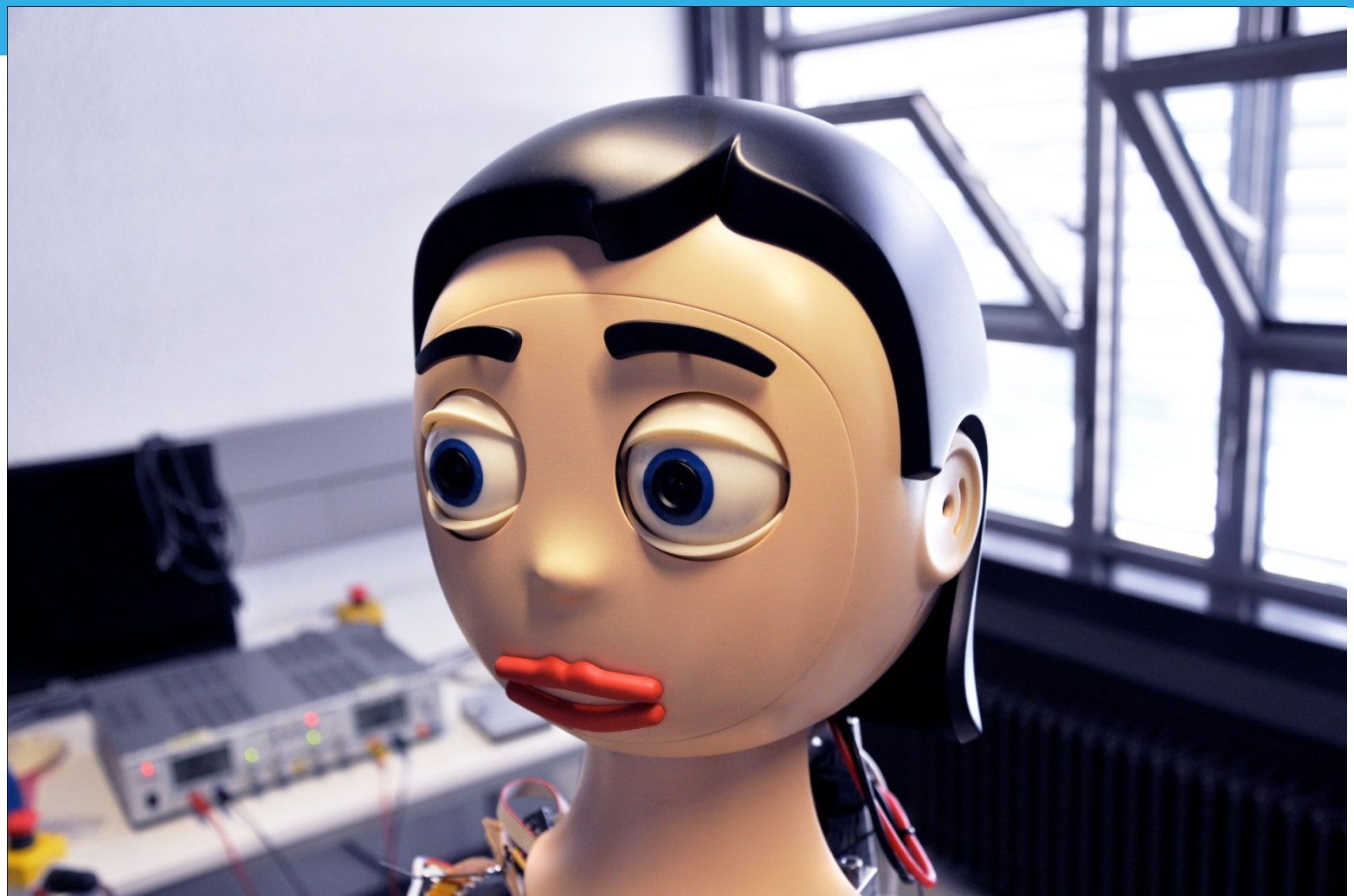




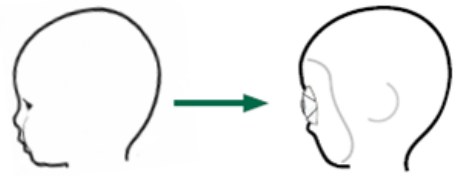


# Flobi



# Flobi: Babyface Cues

schematic drawing of a child



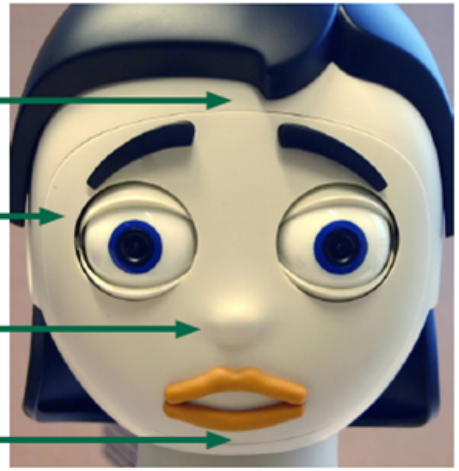
schematic drawing of Flobi

Curved forehead

big, round eyes

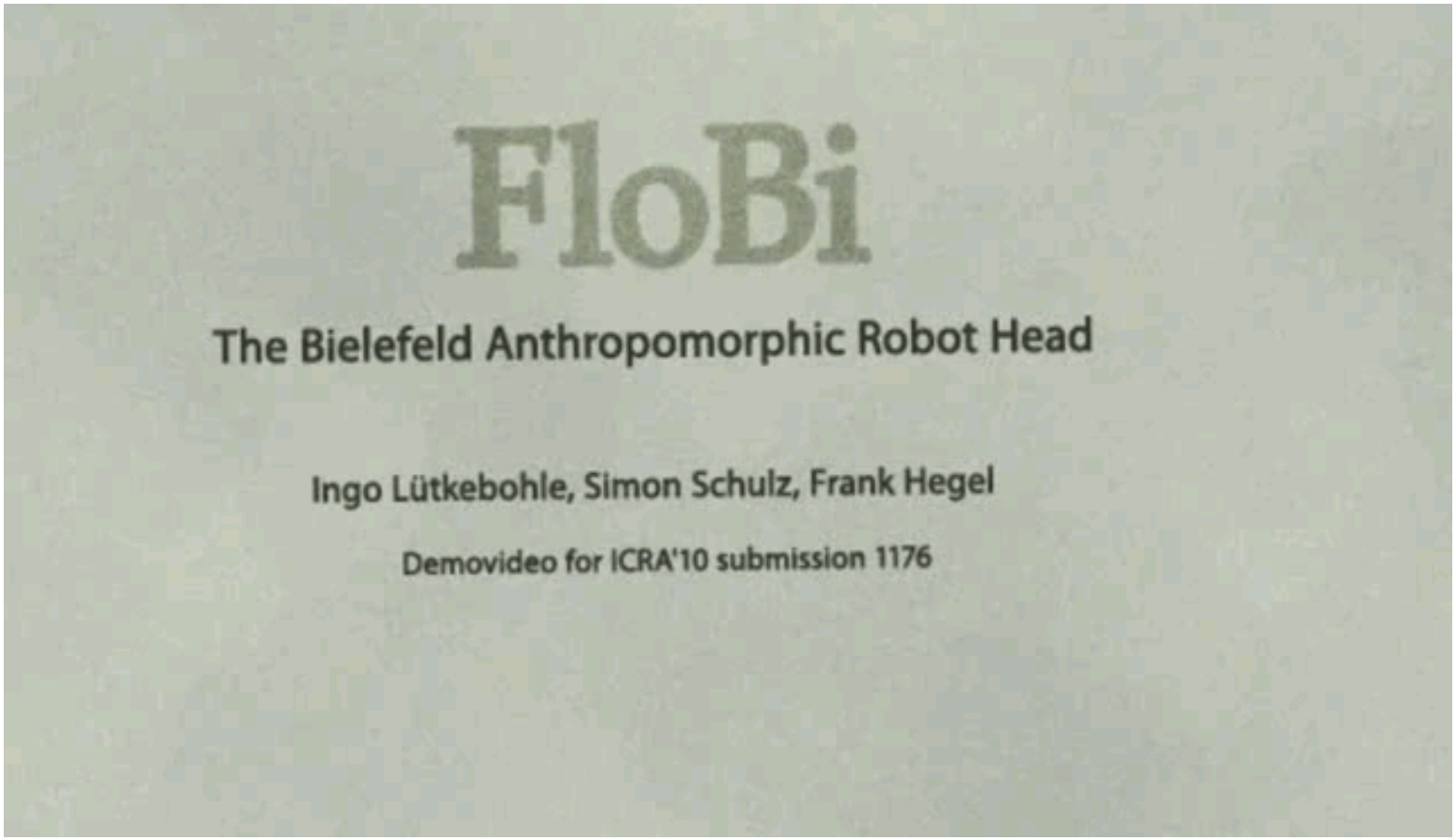
small, short nose

Small chin



Facial elements
(eyes, nose, mouth)
are located relatively low

# Flobi: Demo Video



# Example video from the pairs scenario

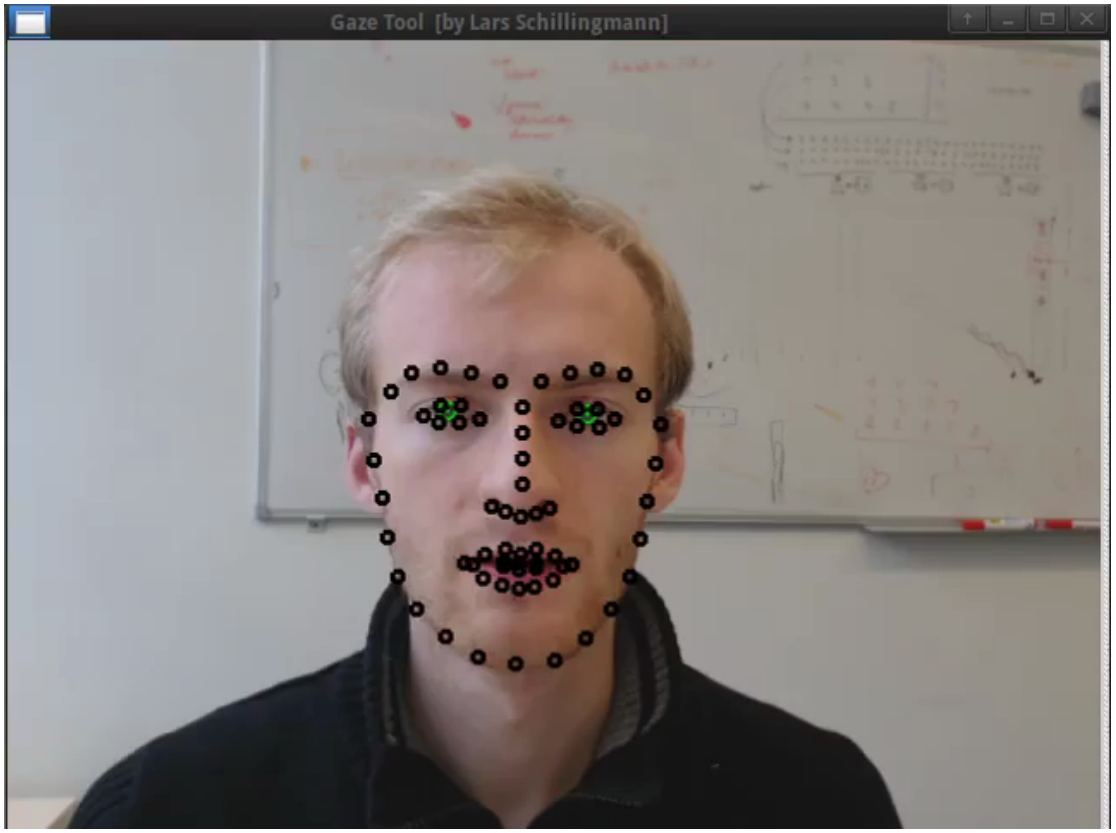

# Flobi + Mekabot = Floka

# SoziRob: Example video from the sports activity

# ToBI – Robocup Tournament Leipzig 2016

# Art Guide Robot

# Recognition of Socio-emotional Signals from Facial Expression -> Face Detection and Tracking of Facial Landmarks



# -> Recognition of Head Pose and Head Gestures (nodding)

# -> Gaze Recognition -> User Attention

# Ludwigshafen