

Building Humanoid Heads

Workshop on the Humanoids 2004

Santa Monica, USA

10th -November 2004

Prof. Dr. Rüdiger Dillmann

Welcome

Goal of the workshop

- Design and control of human-like heads
- Active vision systems for humanoid robots
- Perceptual algorithms and models of attention
- Perception of humans, including articulated body tracking
- Interpretation of human actions and behaviors
- Natural multimodal human-humanoid interfaces
- Models of cognition and cognitive development

Emotion Expression and Social Interaction

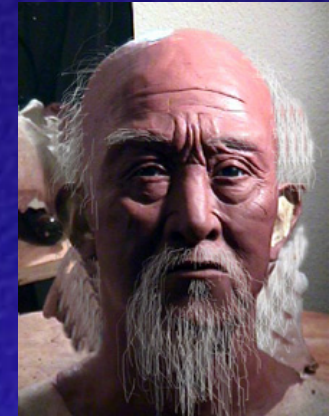
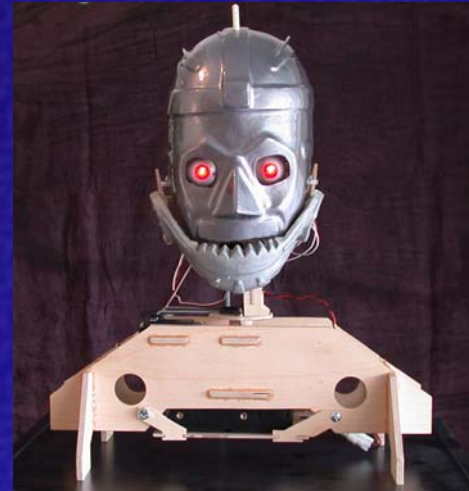


Kismet, MIT



WE-4R
(Waseda University)

Animatronic Heads



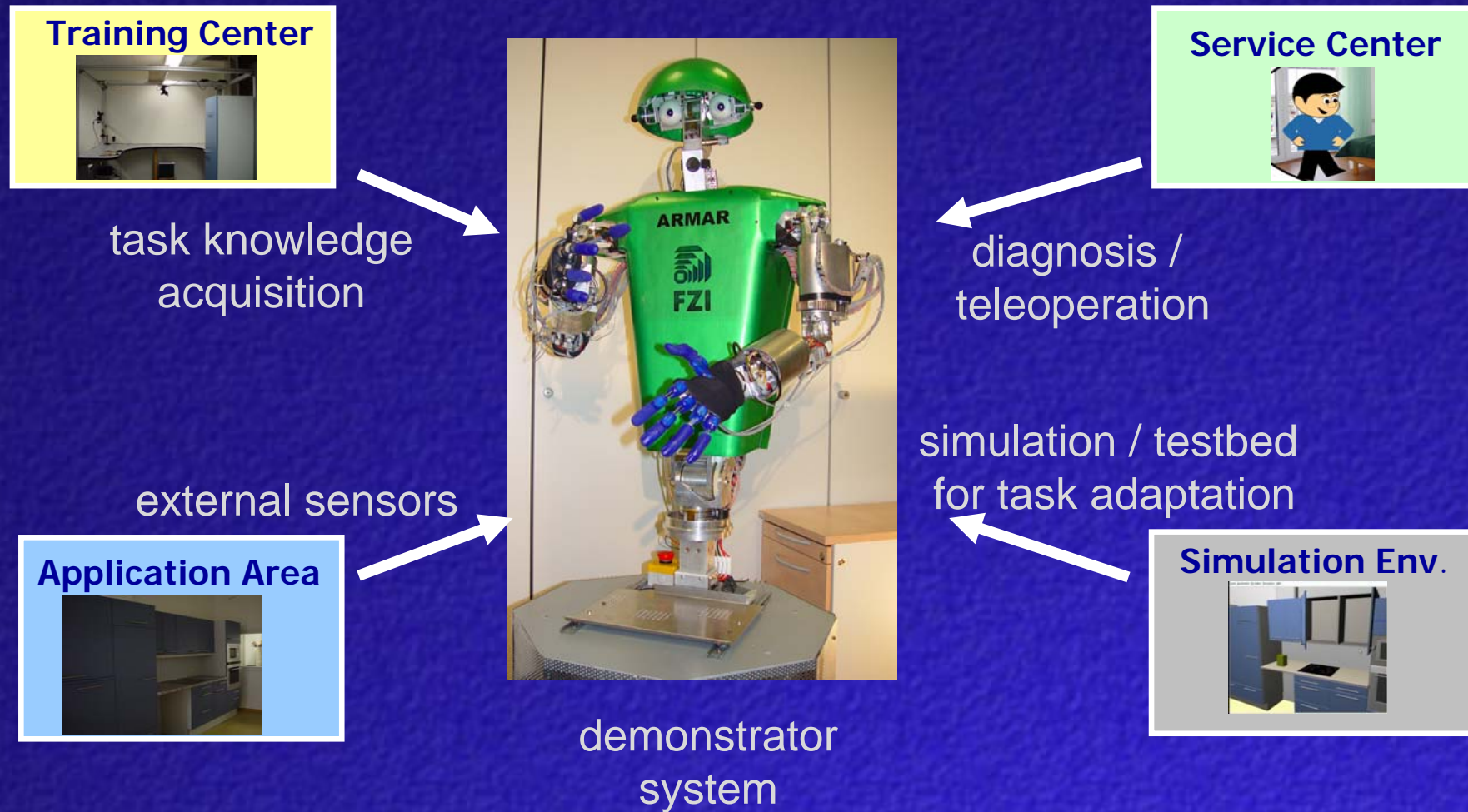
Design Considerations

- How human-like should it be ?
 - Appearance
 - Sensory-motor system (Sensors, DoFs, speed, ...)
- Functionalities and addressed tasks
 - hand-eye coordination
 - Perception and tracking of humans
 - Dialogue, facial expression ?
 - ...
- Sensors, motors, functionalities versus onboard computing power

Research fields

- Development of all kinds of enabling technologies
 - Mechatronics and motor control
 - Real-time learning of oculomotor behaviors
 - Active object recognition
 - Scene analysis
 - Audio-visual perception of humans
 - Head design for human-like appearance, facial expressions, ...

SFB 588: Project Areas



Program

- Jan Olof Eklundh
Active Object Recognition under Gaze Control
- Atsuo Takanishi and Hiroyasu Miwaakanishi
**Emotional Control of Emotion Expression
Humanoid Robot WE-4R11**
- Ales Ude
**Foveated Vision and Object Recognition on
Humanoid Robots**

Program

- Giulio Sandini
Gaze Control and Manipulation
- Aryananda Lijin and Jeff Weber
MERTZ: Toward a Robust Sociable Humanoid Head Robot
- Rainer Stiefelhagen
**Towards Natural Human-Robot Interaction:
Audio-visual perception of Humans
and their Communication Modalities**

Discussion

- Presentations will be available on-line on the workshop homepage
- Papers for a special issue or book (Springer STAR Series)