

# Overview of Research Projects at the AI Group of Freiburg University

Christian Becker-Asano  
(Prof. Bernhard Nebel and Prof. Kai Arras)  
Computer Science Department  
Albert-Ludwigs-Universität Freiburg  
Germany

# About me

---

- PhD in Computer Science, Bielefeld University, 2008
- PostDoc, ATR, Kyoto, Japan, 2008 – 2010
- AvH return fellow & FRIAS junior fellow, Freiburg University, 2010 – 2011
- Lecturer, Foundations of AI, since 2012
- Interests:
  - Affective Computing
  - Social Robotics
  - Dynamic epistemic logic / AI

## Emotion in Human-Agent Interaction:

- **Coping with Virtual Emergencies**
  - emotion elicitation and recognition
- **Tele-presence robotics with DARYL**
  - mediated communication in the lab and in the wild
- **The hybrid agent MARCO**
  - chess as multimodal interaction
- **Multi-agent passenger simulation**
  - emotion simulation and simulated wayfinding

# Coping with Virtual Emergencies: Demo video

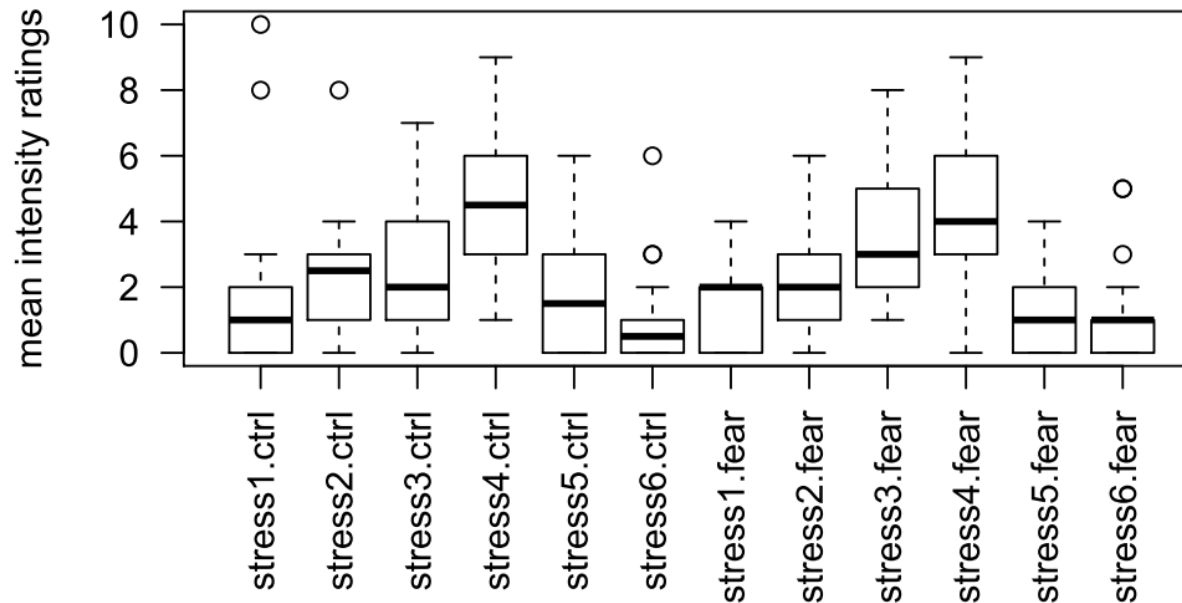
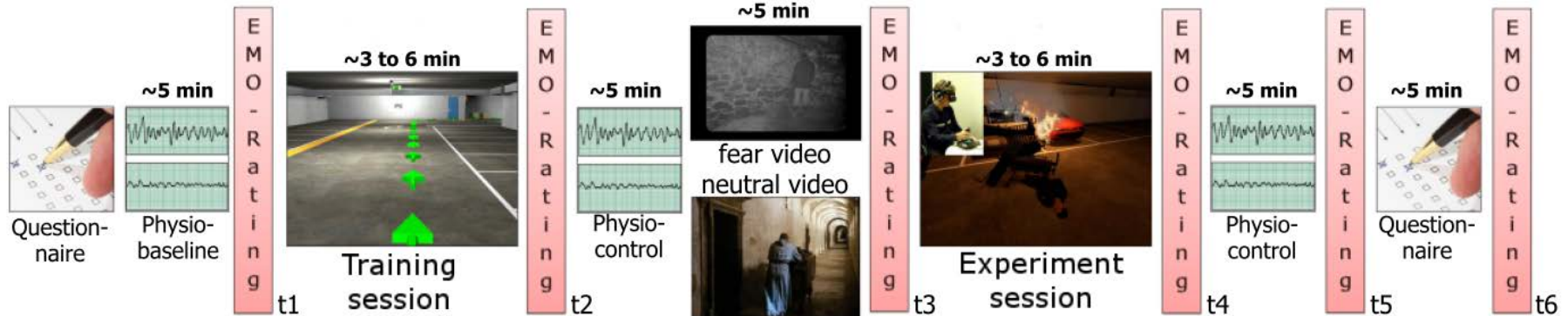
---

Bewältigungsverhalten  
in Notfallsituationen

Timer -22s  
(B1: 8s)

Demo-Video

# Coping with Virtual Emergencies

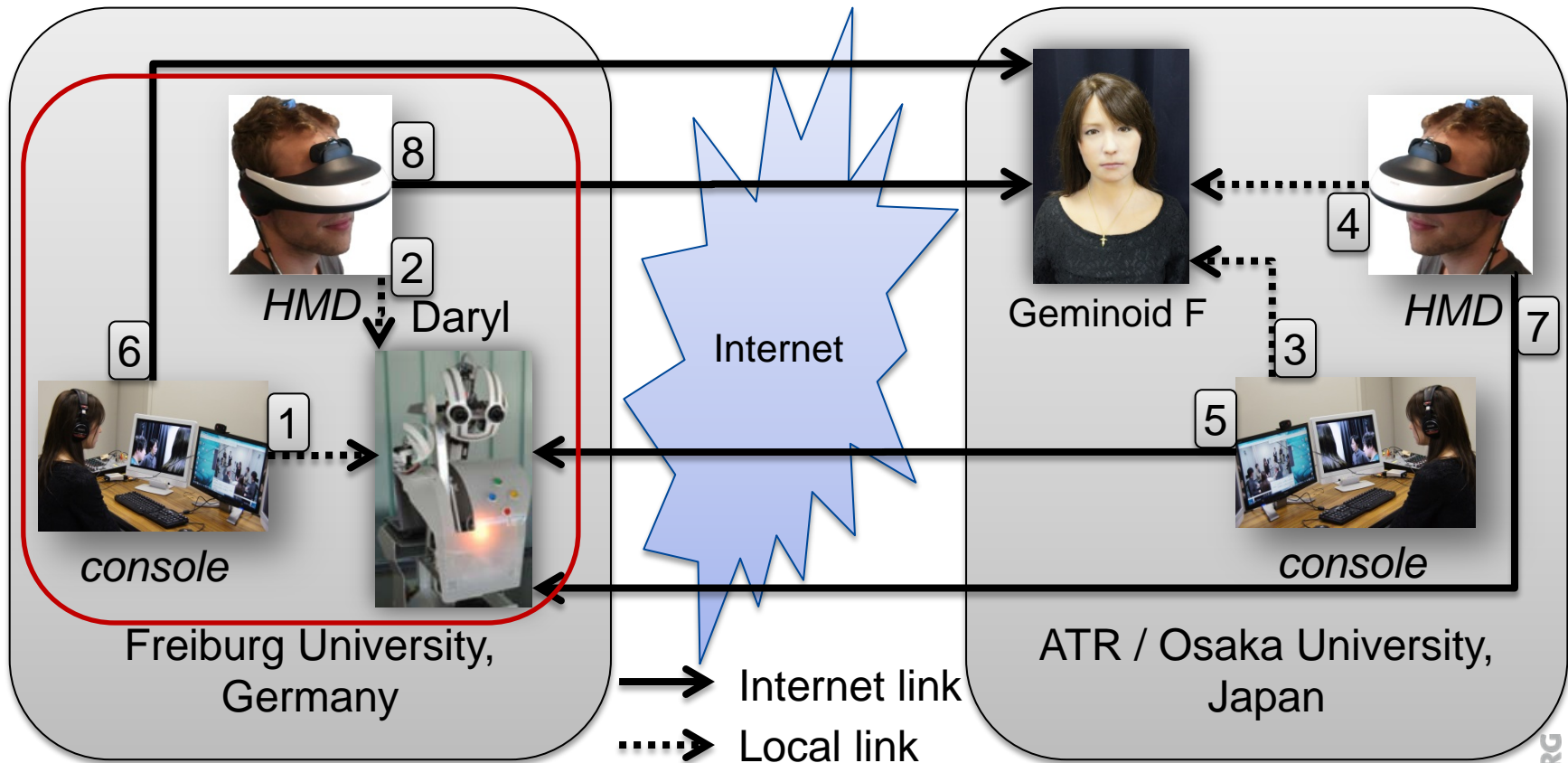


## Emotion in Human-Agent Interaction:

- Coping with Virtual Emergencies
  - emotion elicitation and recognition
- Tele-presence robotics with DARYL
  - mediated communication in the lab and in the wild
- The hybrid agent MARCO
  - chess as multimodal interaction
- Multi-agent passenger simulation
  - emotion simulation and simulated wayfinding

# Tele-presence robotics with DARYL

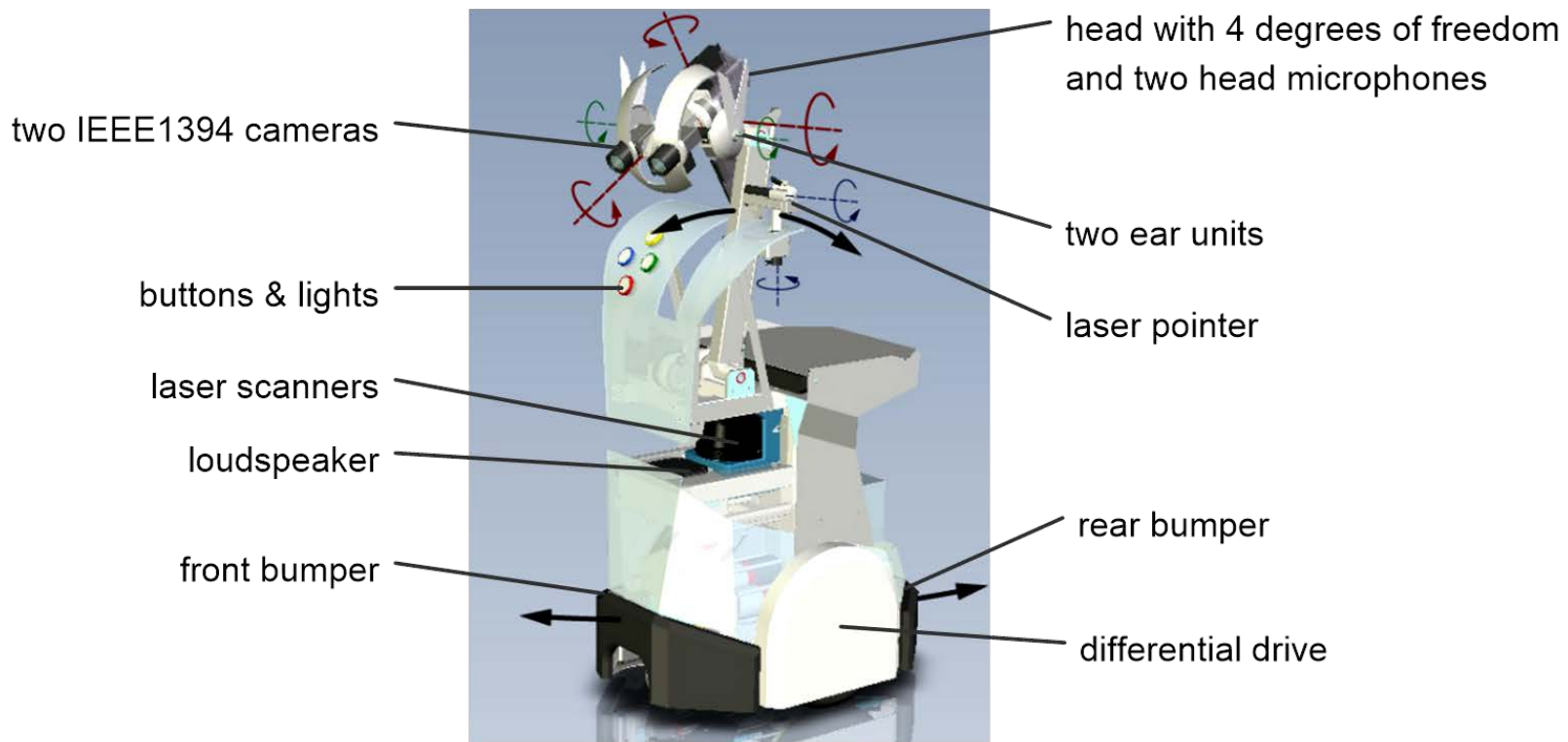
Geminoid F versus DARYL tele-operation study series:



(Becker-Asano et al., 2014)

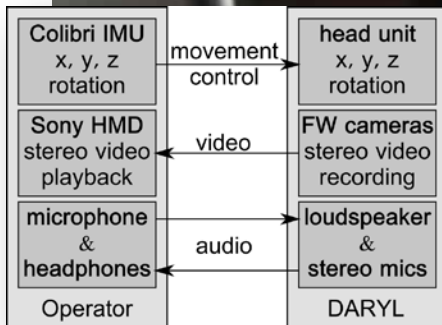
# Tele-presence robotics with DARYL

In the social robotics lab of Prof. Kai Arras:





# Tele-presence robotics with DARYL



## Emotion in Human-Agent Interaction:

- Coping with Virtual Emergencies
  - emotion elicitation and recognition
- Tele-presence robotics with DARYL
  - mediated communication in the lab and in the wild
- The hybrid agent MARCO
  - chess as multimodal interaction
- Multi-agent passenger simulation
  - emotion simulation and simulated wayfinding

# The hybrid agent MARCO



## Emotion in Human-Agent Interaction:

- Coping with Virtual Emergencies
  - emotion elicitation and recognition
- Tele-presence robotics with DARYL
  - mediated communication in the lab and in the wild
- The hybrid agent MARCO
  - chess as multimodal interaction
- Multi-agent passenger simulation
  - emotion simulation and simulated wayfinding

# Multi-agent passenger simulation

In cooperation with:

- Cognitive Science Institute, Freiburg
- FraPort AG at Frankfurt airport

Status quo Signage

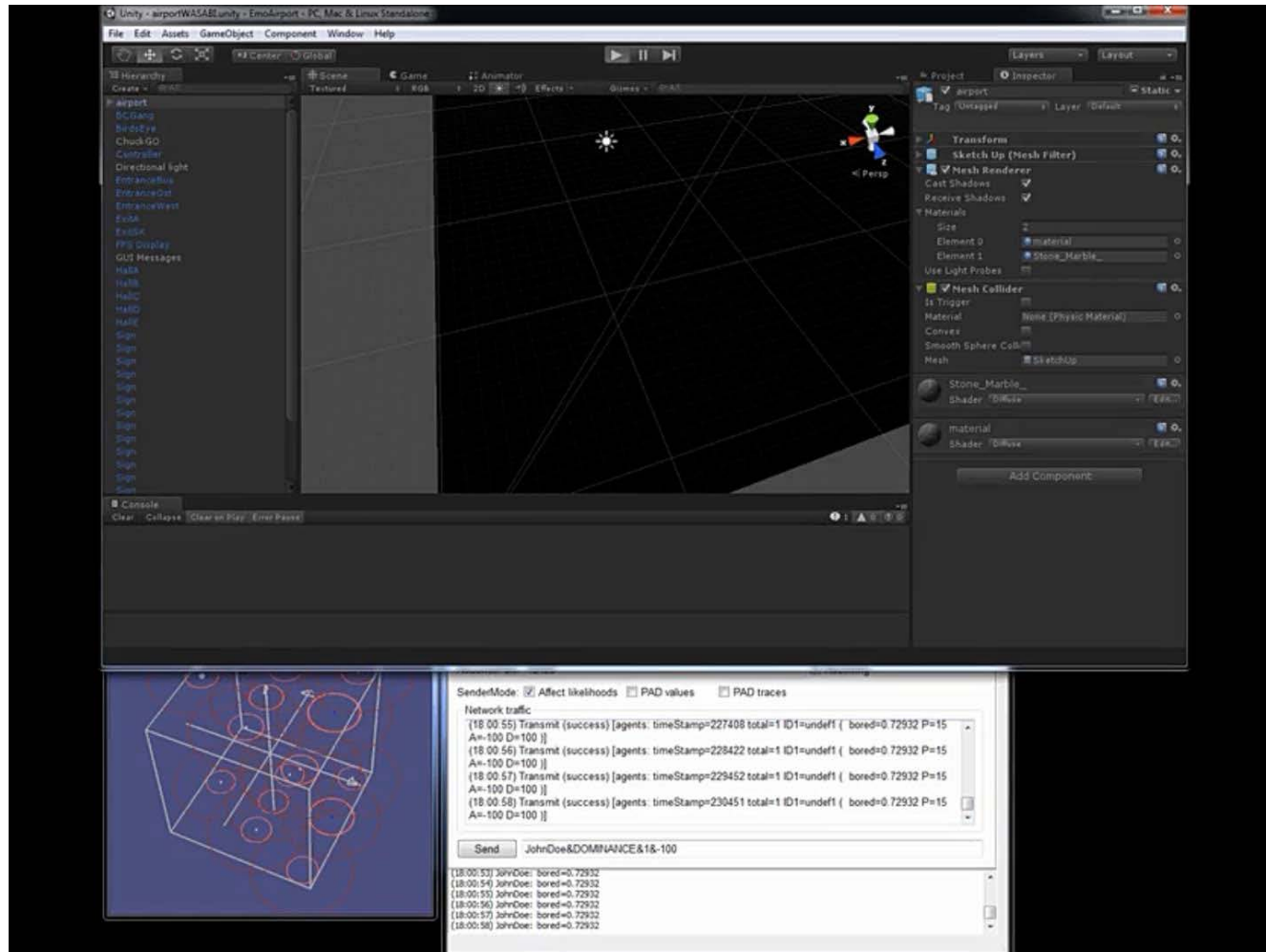


Redesigned Signage

(with a central sign added by digital editing)



# Multi-agent passenger simulation Demo

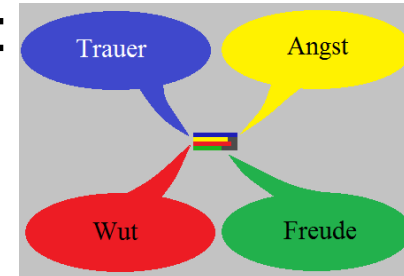


# Multi-agent passenger simulation

## Emotions: WASABI vs. OCC

Facial expressions impossible to decode:

- Intensities of four emotions encoded into bars above the agent's head
- Special agents (i.e. the thief) marked by yellow object



Demo



# Summary

---

## Emotion in Human-Agent Interaction:

- Coping with Virtual Emergencies
  - emotion elicitation and recognition
- Tele-presence robotics with DARYL
  - mediated communication in the lab and in the wild
- The hybrid agent MARCO
  - chess as multimodal interaction
- Multi-agent passenger simulation
  - emotion simulation and simulated wayfinding

Thank you for your attention!