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HRI Caught on Film 2

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ABSTRACT
Following the great success of the first video session at the HRI 2007 conference (Bartneck & Kanda, 2007), the Human Robot Interaction 2008 conference hosted the second video session, in which movies of interesting, important, illustrative, or humorous HRI research moments were shown. Robots and humans do not always behave as expected and the results can be entertaining and even enlightening – therefore instances of failures have also been considered in the video session. Besides the importance of the lessons learned and the novelty of the situation, the videos have also an entertaining value. The video session had the character of a design competition.

Categories and Subject Descriptors
H5.0 [**Information Interfaces And**]: General

General Terms
Documentation, Human Factors

Keywords
Human, Robot, Interaction, Film

1. INTRODUCTION
In the following paragraphs summarize the abstracts of the films presented in the video session of the HRI2008. The contributions are sorted in alphabetical order of the movie titles.

Acceptance Study in a Crowded Pedestrian Area

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Are robots already perceived as a daily companion in daily life, or do people still perceive a robot as something extraordinary, strange or even scary? To evaluate people's social acceptance a breaching experiment was conducted, using the ACE robot in a heavily frequented shopping area, the Stachus, a public place in Munich. 48 participants were selected by chance to take part in the interview, but several others were interacting and observing the robot. What kind of strategies are the participants of the experiment using, to go closer to the robot? How do they interact? Is only one person going there, or is a group of people "better" to reduce the distance between human and robot? The video shows some insightful and funny situations, what happens, when people are disturbed in there normal social norm, by a robot asking for the way in a shopping area.

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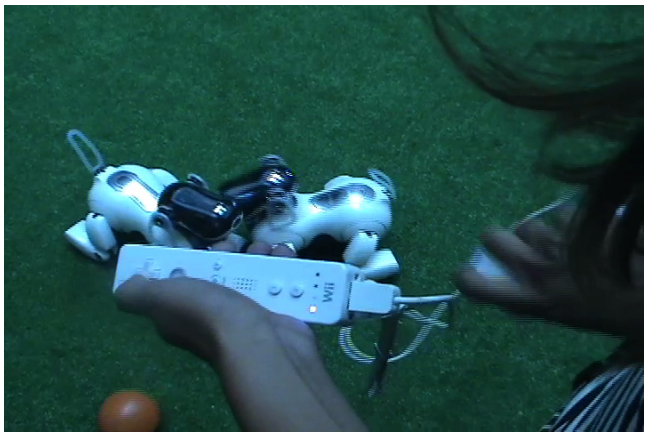

Brown Robotics: Game-Based Learning

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One of the biggest challenges in robotics today is to create machines that are not preprogrammed for each individual task, machines that can learn on their own. We are the Brown University Robotics group. Our mission: to teach robots to teach themselves. Working towards this goal, Brown Robotics has been developing algorithms for learning from demonstration to enable robotic decision making similar to that of a human teacher. To facilitate long-term human-robot interaction, we have developed fun and interesting video game style robot control interfaces using devices such as the Nintendo Wiimote.

GlowBots — A Love Story

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We present a small episode describing how a young girl meets a swarm of GlowBots for the very first time. The film-clip was captured at Emerging Technologies exhibition, SIGGRAPH 2007, where we experienced an overwhelming attention with more than five thousand visitors laying their hands on our group of GlowBots. In this particular case the young girl is instructed by a staff member and immediately starts to play with the robots. She is really touched by the beautiful patterns showing on their round LED-displays and picks them up, shakes them and gently puts them back down. Her interaction with the robot encourages it to wonder off and communicate its pattern with other robots. The result is an ongoing dialogue between the robots about the latest fashion in attractive patterns. The robotic design is based on a previous study where we interviewed owners of rather unusual pets such as snakes, spiders and lizards. We have then tried to transfer some of the qualities found in their interaction and relationships with their pets to explore the design-space in everyday robotics. GlowBots is the first proof-of-concept robotic implementation that came as a direct result from this study.

Hands-free Human-Robot Interaction

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Robots have long assisted humans with repetitive, arduous, and especially dangerous tasks. The introduction of fast and ruggedized mobile platforms has increased the feasibility of deploying robots along side humans rather than in disjoint groups. In this paper we present a robotic system that integrates naturally with a human user. The key benefits of this work include intelligent person detection and tracking, intuitive robot control through the use of gesture and voice commands, and user feedback via speech synthesis. These attributes allow a robot to operate in close proximity with a human teammate without the need for joystick-based control.

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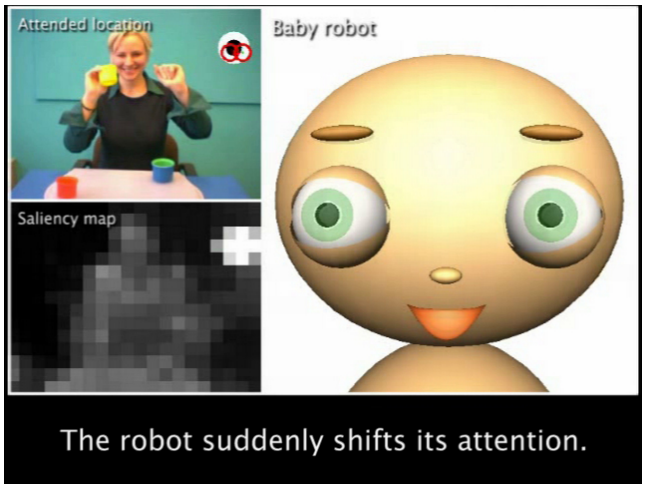

How Does a Disturbance Affect People in HRI?

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We conducted an observational experiment to find out the effects of disturbance in human-robot interaction (HRI). Disturbance is usually an undesired phenomenon and thus has not been investigated in the field of robotics. In order to reveal how people deal with an interrupted communication, we built a HRI scenario in which the visual attention for a robot simulation has been attracted by an irrelevant object. The robot's attention was controlled based on saliency derived from the primitive features of the input image. We created a disturbing situation by superimposing a highly contrasted object in the robot's vision. Our movie shows diverse responses of human partners trying to re-establish the communication. They, for example, addressed the robot's attention by moving into the line of the robot's gaze and following it. Some exaggerated their actions and tried to re-attract the robot's attention by approaching the robot, closely showing an object, amplifying their body movement, and making noise. Others tested their hypothesis on the robot's following behavior by systematically evaluating the robot's reactions while reducing/increasing their activities. All the spontaneous reactions show that the human partners did not expect any disturbances but could cope with them as they have experienced in human-human interactions.

iCat as Personal Assistant for Diabetic Children

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Large groups of the Western population have a life-style that invokes risks for the health, e.g., increasing the chance or severity of chronic disorders like obesity or diabetes. Social robots might help to persuade children to take care of their health in daily activities (e.g., to reduce obesity or to cope with chronic diseases like diabetes). Based on a domain and literature study, we specified three roles for such a robot (i.e., coherent clusters of functions that support a general objective): motivator, educator and (game) buddy. These roles could be well implemented in a physical robot (the iCat), somewhat less in a virtual robot, and least well in a chatbot. In an evaluation with twenty 8 to 9 year olds, children expressed high appreciation of both the physical and virtual robot, and proved to interact faster with these robots than a chatbot. The motivator and educator roles prove to be appropriate for both older adults and children, and the iCat is a good platform to implement and test such roles for both user groups. The game buddy role was important for the engagement of the children with the personal assistant.

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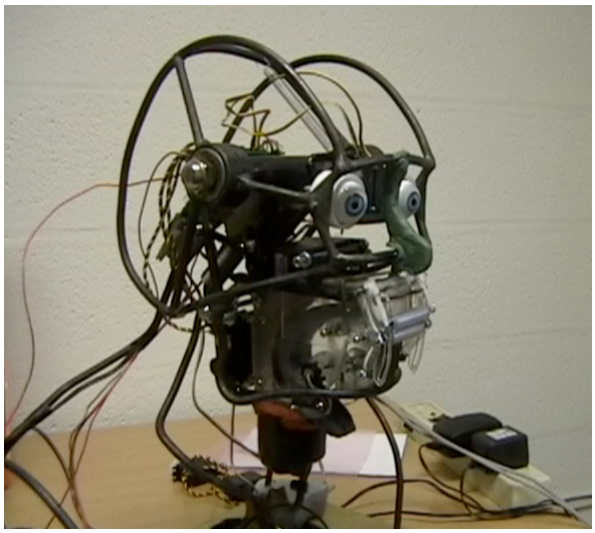

Jack37.p1: Demonstration of a mechanical vocal tract for speech interaction research

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This video clip depicts robotic babble learning as the motor output parameters of an ART-based artificial neural network ("ART-PaC architecture") control a mechanical vocal tract. The network auto-associates resulting sound input with its own motor output. The tract is housed in a humanoid animatronic head for multimodal speech research and for human-robot interaction research. For further information, please see:

http://www.fluidbase.com/mike/projects/VoxHead/index.html

Keepon Dancing to Spoon's "Don't You Evah"

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Keepon is a robot designed to interact in a simple and intuitive manner with children. It is used in research on social development and nonverbal communication as well as in therapeutic practice with children with developmental disorders. With four degrees of freedom, cameras for eyes, and a microphone for a nose, Keepon can participate in attentional, emotional, and rhythmic interaction--usually under the control of a teleoperator who assumes the robot's perspective. Keepon's capability for rhythmic behavior was originally demonstrated in a video of the robot dancing to the rock band Spoon's "I Turn My Camera On." Based on the video's viral popularity, the first and second authors were invited by WIRED Magazine to join Spoon in Tokyo to create this professional follow-up video. It features Keepon and his caricatured creator (the first author) walking around Tokyo and attempting to dance with other people and machines. Spoon members make inconspicuous cameos. The robot operates under a combination of autonomous rhythmic behavior and wireless attentional control (programmed by the second author). The video concludes with a dance party in a robot store, staged with the support of members of Tokyo's hobby robotics community. See beatbots.org for more information.

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Vision of Safe and Human-Aware Robots within SMErobot™

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The consortium of the EC funded SMErobot™ research project (www.smerobot.org) produced a film "Coffee Break" of their research aims. The video visualizes the integration of a new robot generation based on the example of the variable applications in a fictive small enterprise. However, this video demonstrates the vision with computer-animated robots. It provides an outlook what you will see in reality at Automatica fair 2008.

Tom and Michael work for a small company producing small badges of parts and materials of all kinds and finally assembling them. Welding, chamfering, drilling, sawing, grinding, polishing, mounting are all part of their daily routine. They imagine during their coffee break how to build up a robot assistance to facilitate their work and develop new, flexible and multi functional instrument robot systems to cooperate with humans in an intuitive and safety way.

The following two innovations of the project have been extracted from the film to present them during the HRI2008 video session:
1) Robot capable of understanding human-like instructions (by voice, gesture, demonstration): programming should be as simple as telling a colleague to perform a certain task. Therefore, future robot instruction schemes require the use of intuitive, multimodal interfaces and preferably human communication channels, such as speech and gestures. Identification and localization of work pieces, automatic generation or adaptation of programs and process parameters are also required for minimizing programming efforts.

2) Safe and productive human-aware space-sharing robot (cooperative, no fences): Intrinsically safe robots are claimed to be the cornerstone of future manufacturing concepts such as the space-sharing co-worker for human-robot cooperation. It is recognized that an intrinsically safe robot requires research towards safe mechanics, human motion perception, and safety-conformable layouts and controls. In applications where this is not physically possible, a complementary approach based on active dependable control and human-aware motions is needed.

Robots on Stage: HRI Research with Actors

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Acting can be considered study of human interaction. If this is true perhaps actors and the realm of theater can provide insight into Human Robot Interaction. In this video, we show highlights of recent events performed as part of a collaboration between the Department of Computer Science and Engineering and Performing Arts Department at Washington University in Saint Louis. The video illustrates three projects that represent the initial work of this collaboration: 1) We are comparing actor head motions to those of a stereo camera setup on a pan/tilt unit on our robot. We then asked subjects to compare each video. 2) We included a robot in a theater event called Day o' Shame, where short pieces are written rehearsed, and performed in a 24 hour period. The actor-robot interactions during rehearsal and performance were recorded for analysis, in addition to the audience reactions to the event. 3) We have used the robot as the lead in an acting exercise called Viewpoints, which focuses on the exploration of movement. The robot served as an instructional tool and gave us an opportunity to explore the possibilities of its own motion.

2. ACKNOWLEDGMENTS

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3. REFERENCE

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