SKILLS Integrated Project: Industrial Demonstrations

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DLR: Germany | Simonazzi: Italy | PERCRO: Italy

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CEA-LIST: France

SKILLS

Multimodal Interfaces for Capturing and Transfer of Skill

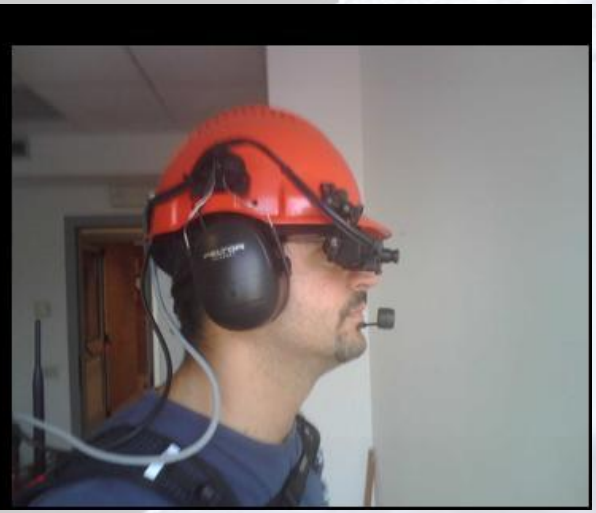
Who Am I?

- 2000: B.Sc., Faculty of Industrial Engineering and Management, Technion
- 2003: M.Sc., Industrial Engineering, Technion
- 2007: Ph.D. (submitted), Technion
- Specialization: Human-computer interaction and human factors engineering
- Currently: Post-doc research fellow in the Skills project, focus on the industrial demonstrations

The Industrial Demonstrations

Programming By Demonstration

Training of Operation and Maintenance



Our Related Study

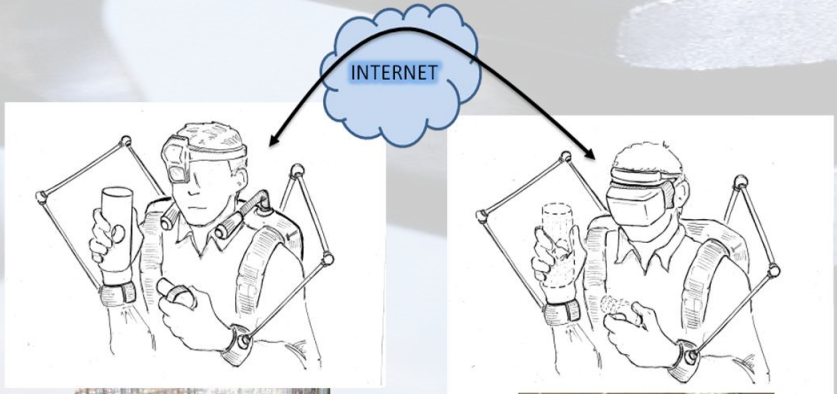
- The demonstration involved: On-line performance of operation and maintenance using Augmented Reality (AR)

- Research topic:

Remote Guidance Using Augmented Reality

The Role of AR in Remote Guidance

- AR: Enhancement of the natural perception and interaction by adding a virtual information source (Feiner, MacIntyre & Seligmann, 1993).
- AR for remote guidance: Step-by-step information in several modalities: plans, pictures or videos, which helps the user to perform the task (Schwald & de Laval, 2003)



The Influence of AR System Configuration on Cognitive Processes

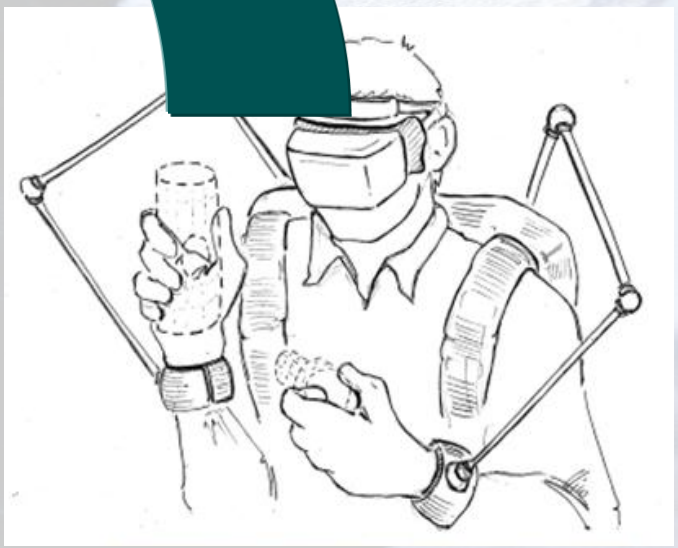
- Haritos & Macchiarella (2005): while using AR, "cognitive tasks can be carried out for the human by the AR system"
- The interaction with cognitive processes depends on the different AR system configurations

3 Performance Measures of Remote Guidance

Mental Models (Norman, 1988; Bout et al., 1999)

AR

Ability to perform the task in the future



On-line, augmented performance of the task

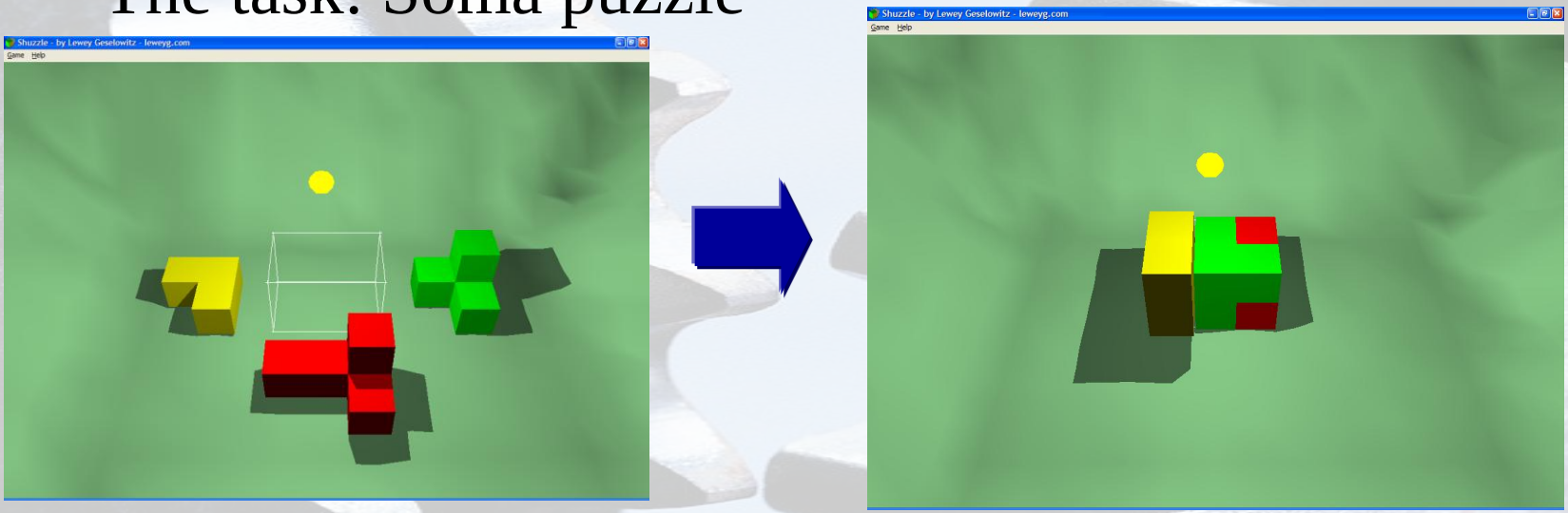
Summary: Study on Remote Guidance Using AR System

AR System Configuration → Cognitive Processes → Performance Measures:

- On-line performance
- Mental Models
- Future Performance

Study No. 1: Plan

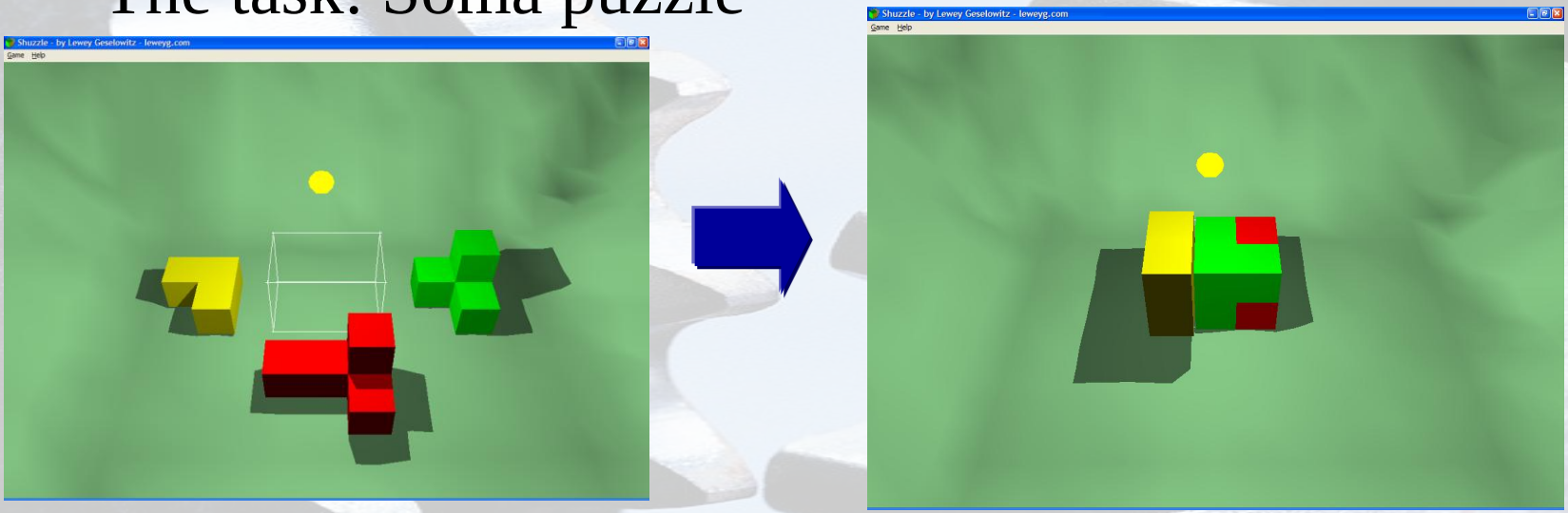
- The task: Soma puzzle



- Remote guidance: (1) none, (2) verbal instructions, (3) verbal instructions + visual aid (pointer on the screen)
- The guide sees the trainee's eye movements: (1) no (2) yes
- Performance measure: on-line performance, mental models, test on the same task, transfer to other tasks

Study No. 1: Hypotheses

- The task: Soma puzzle



- Adding visual aid to verbal instruction will increase on-line performance, but could interfere heavily in cognitive processes -> deteriorate future performance
- Seeing the trainee's eye movements could help during guidance (on-line performance) without the negative influence on future performance

Thanks!

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