

# The Build-It Story

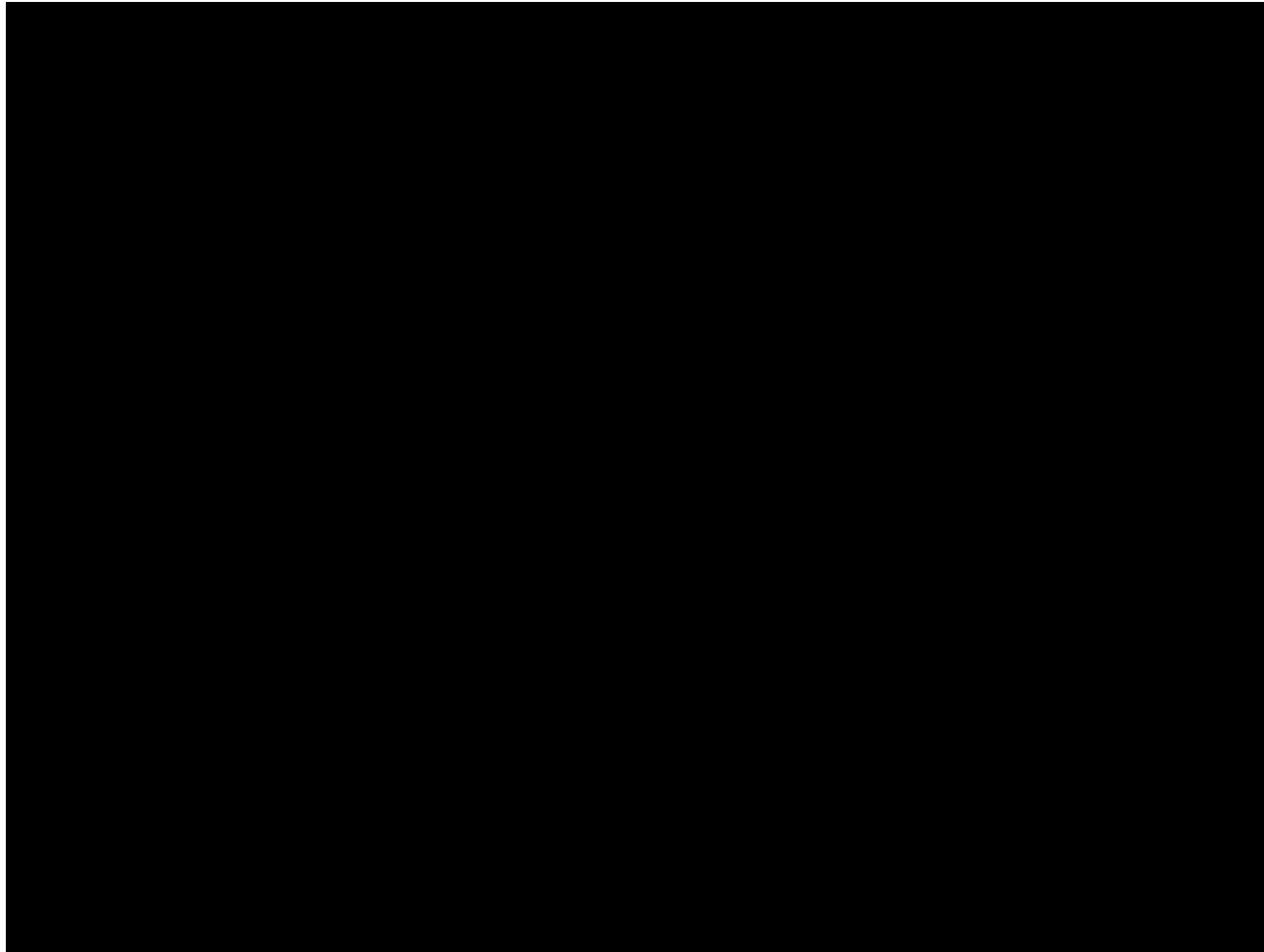
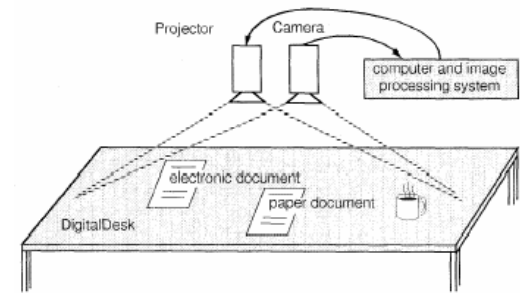
Prof. dr. Matthias Rauterberg

IPO Center for User-System Interaction

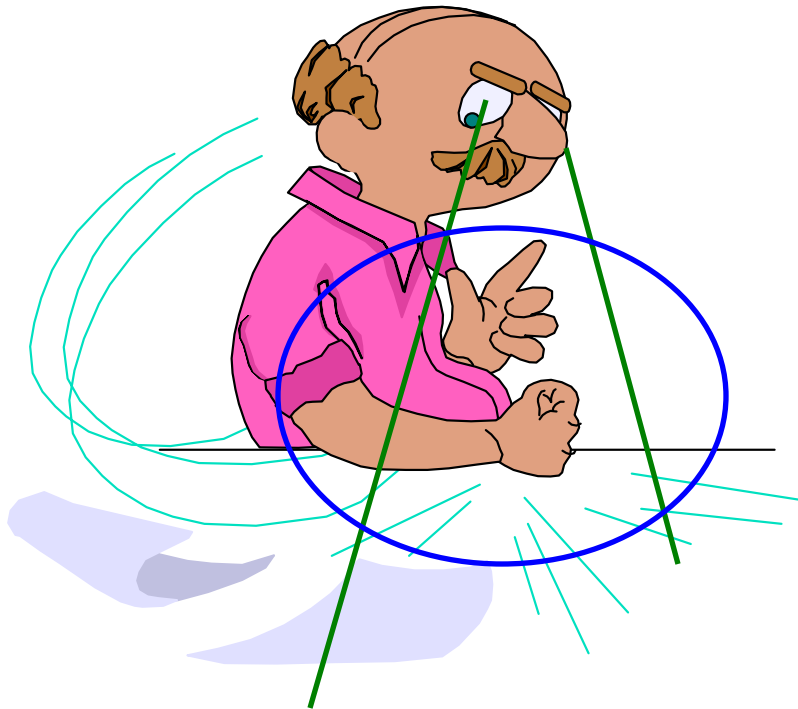
TU/e Eindhoven University of Technology

# The Digital Desk

from Pierre Wellner in 1991



# What is design relevant knowledge?



- **Perception Space**
  - The physical space where the user's attention is.
- **Action Space**
  - The physical space where the user acts in.
- **Design Principle:**
  - perception space and action space must coincide!

# Airline Applications



- This remarkable ultra-lightweight computer, worn as a belt, delivers maximum information to users with a minimum of work.
- Designed for individuals who demand mobility, this computer offers voice control and heads up display for complete, hands-free operation.
- Users can enter or retrieve information while going about their jobs, instead of constantly returning to the shop area to check a stationary computer, or stopping work to punch keys.

# Head-up Displays in Cars



- **More information and less distraction**

Information on the state of the road, on the speed of the vehicle in front (supplied by the intelligent cruise control), on obstacles lying around the next bend in the road identified by the remote detection system, or direction arrows sent by the driver guidance system... drivers will be receiving more and more information from "intelligent" vehicle systems.

# Natural User Interfaces (NUI)

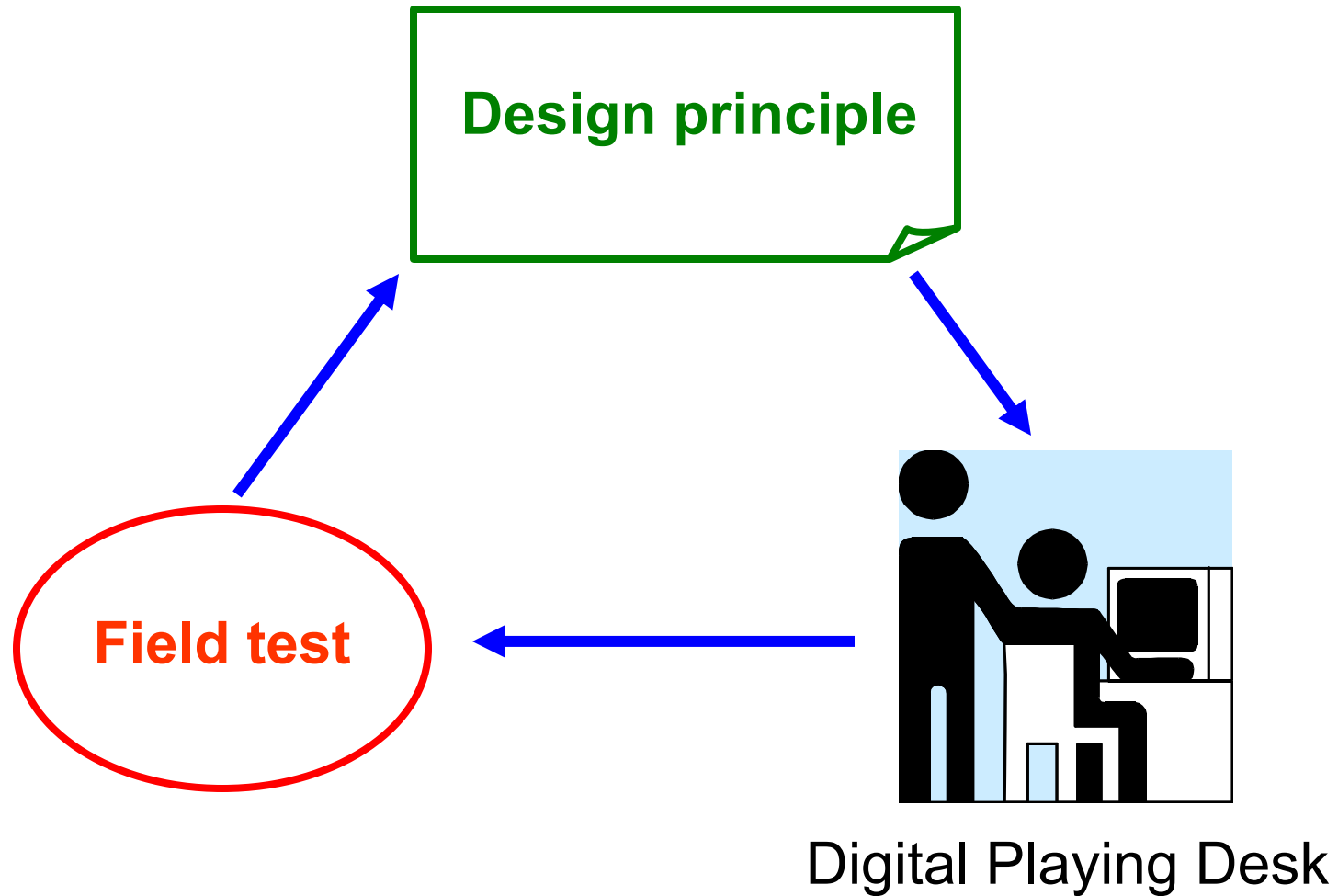
## 1. design requirement

No technical equipment inside the body space of the user!

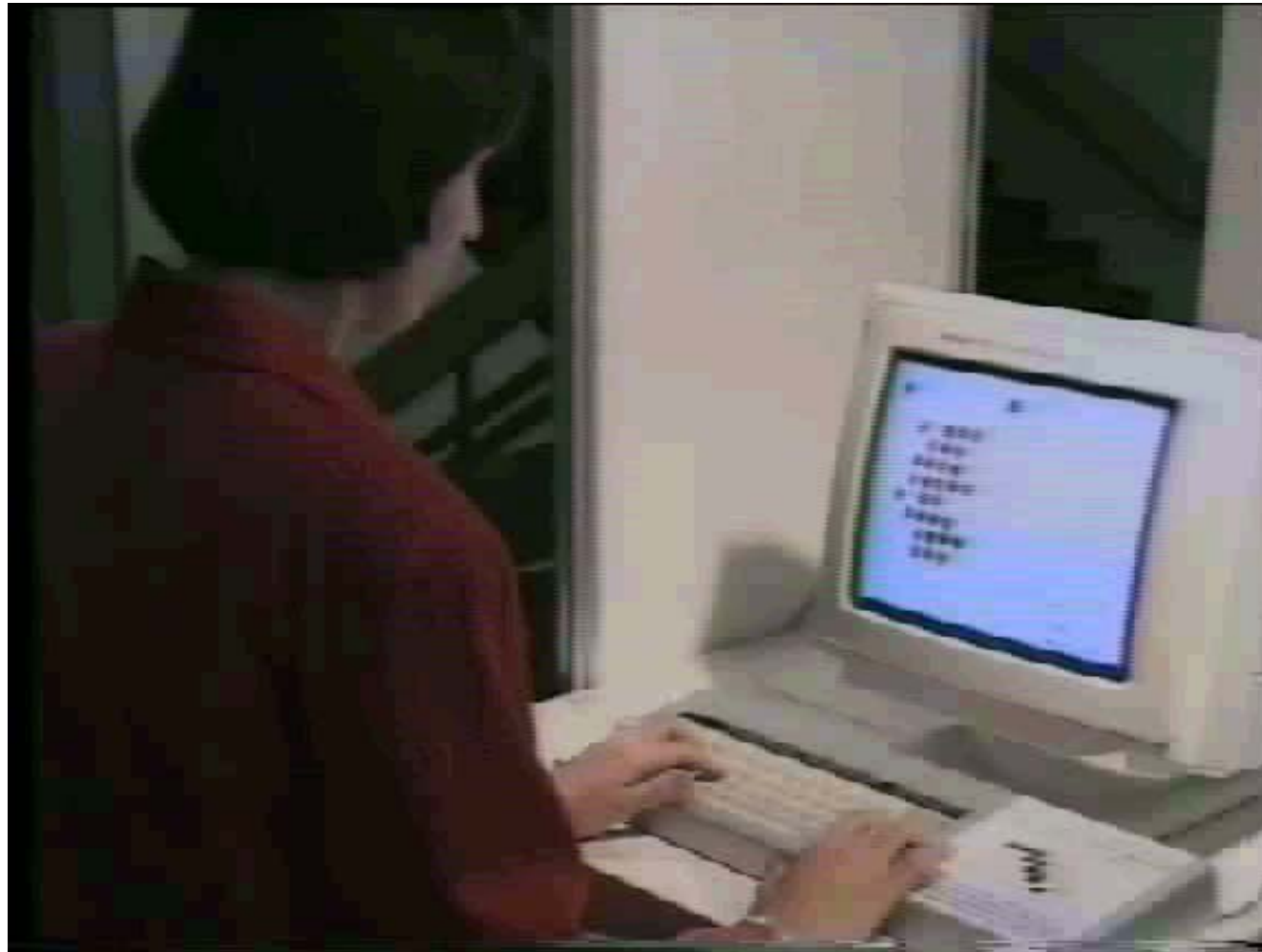
## 2. design requirement

Perception space and action space must coincide!

# NUI: The First Round

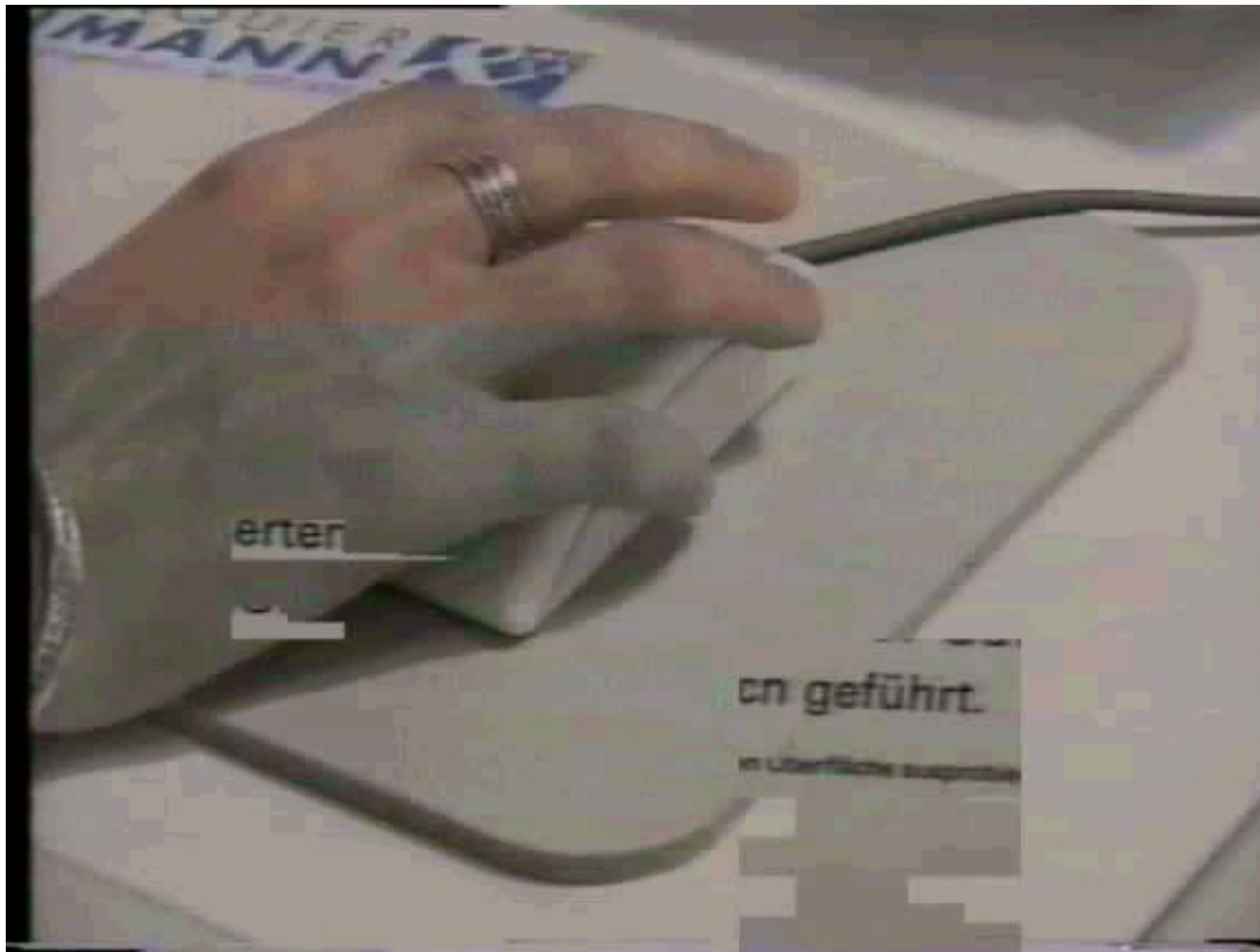


# Command Interface (CI)

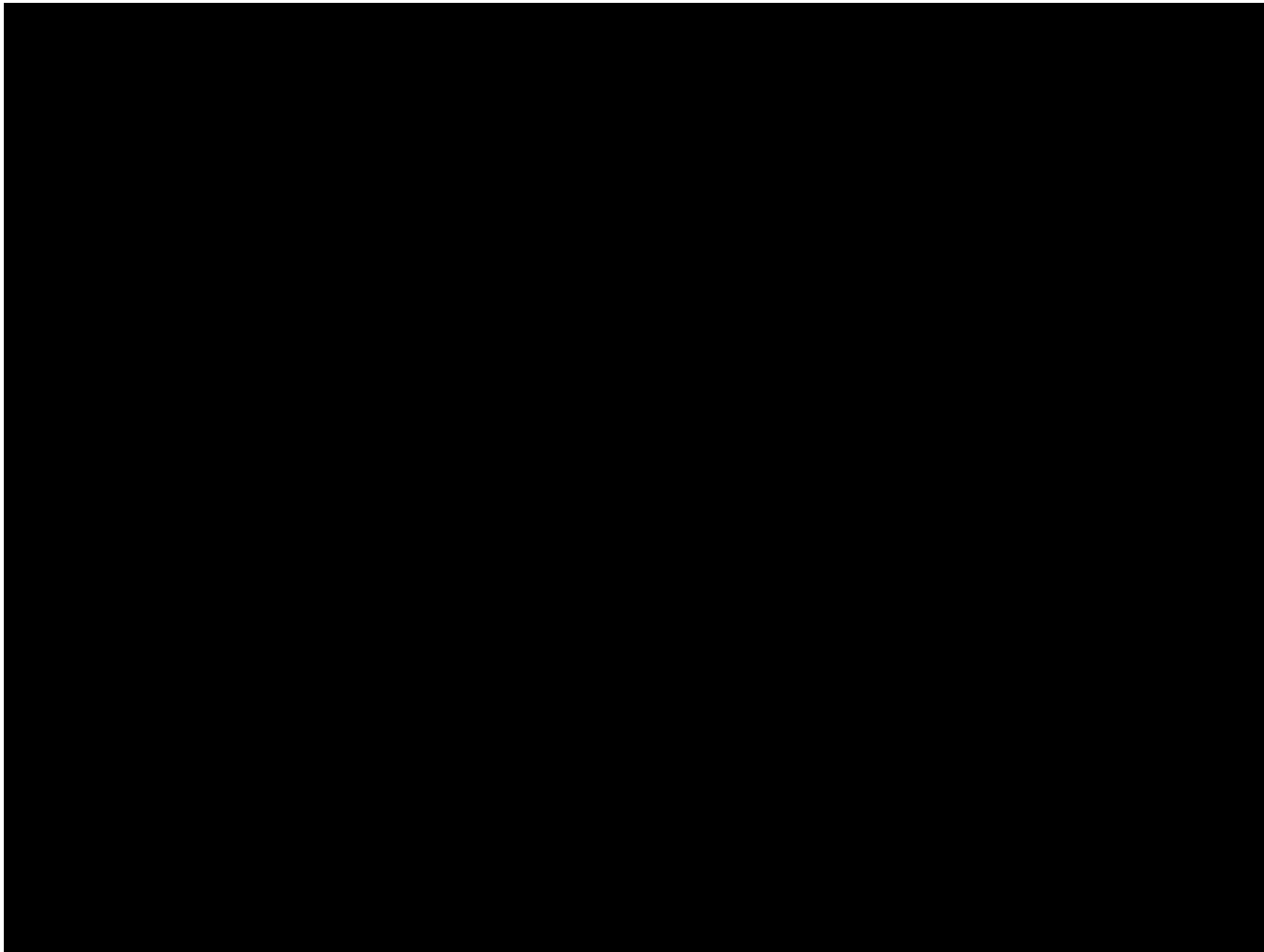




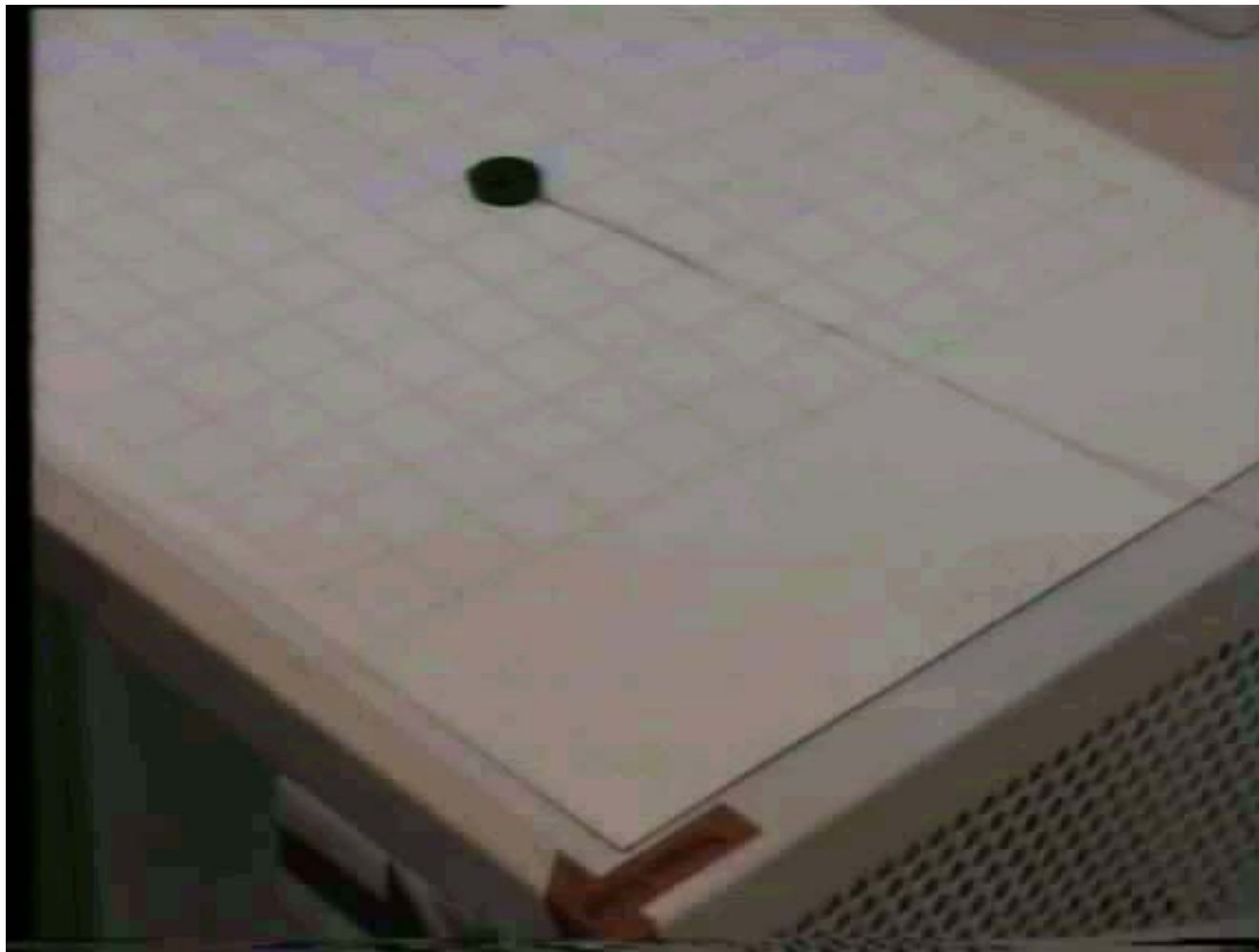
# Mouse Interface (MI)



# Touch-screen Interface (TI)



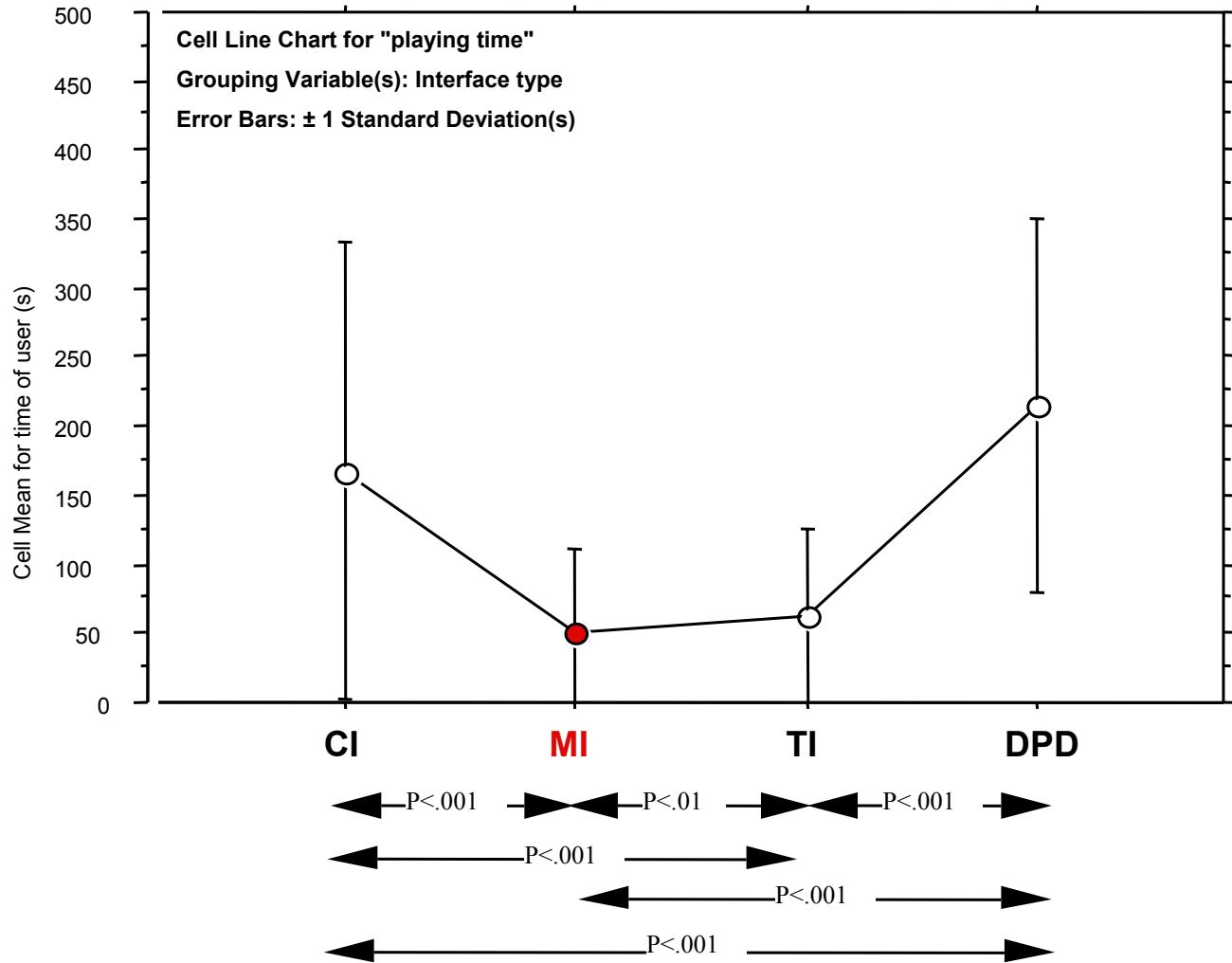
# Digital Playing Desk (DPD)



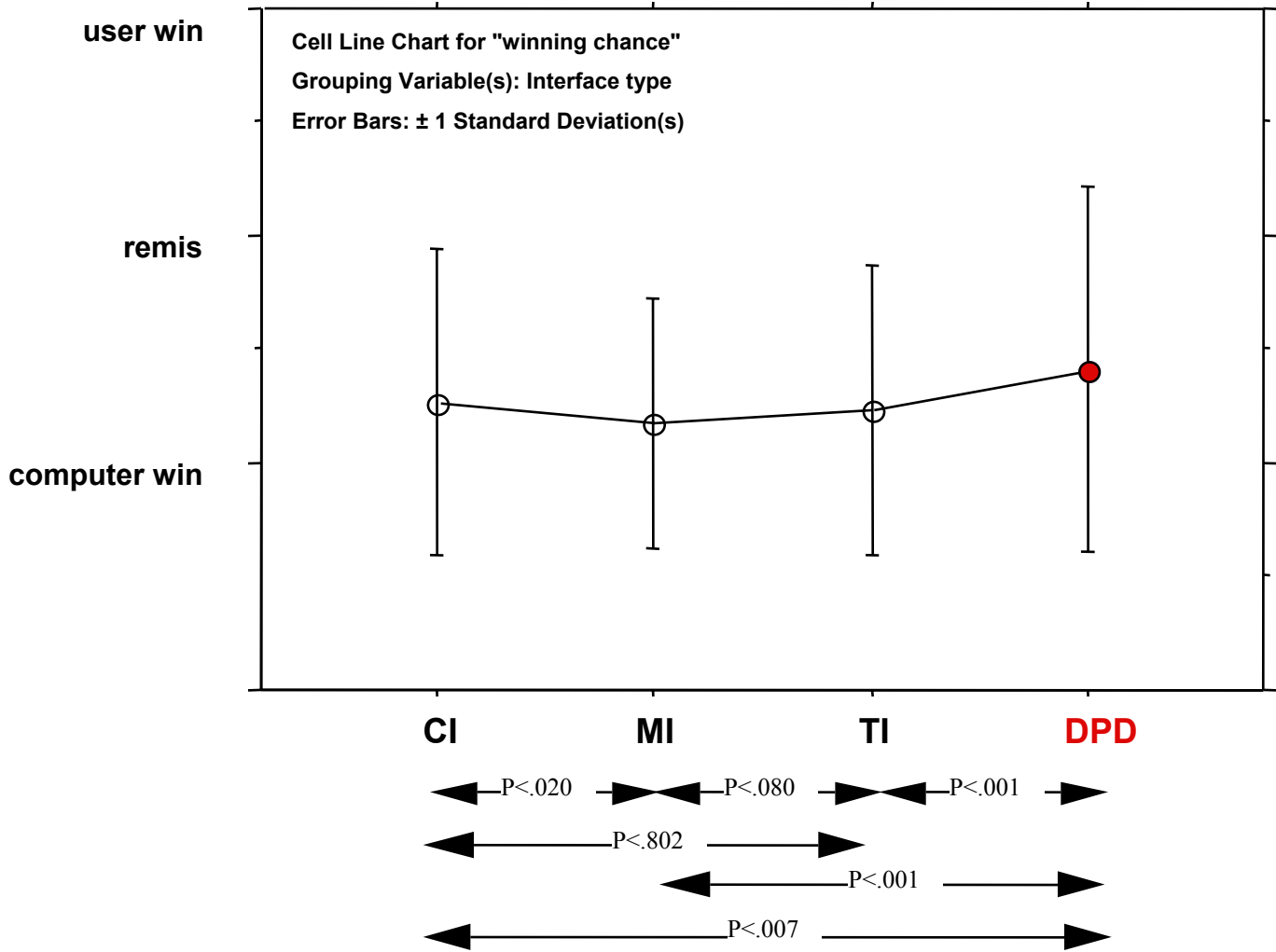
# User Studies with the DPD



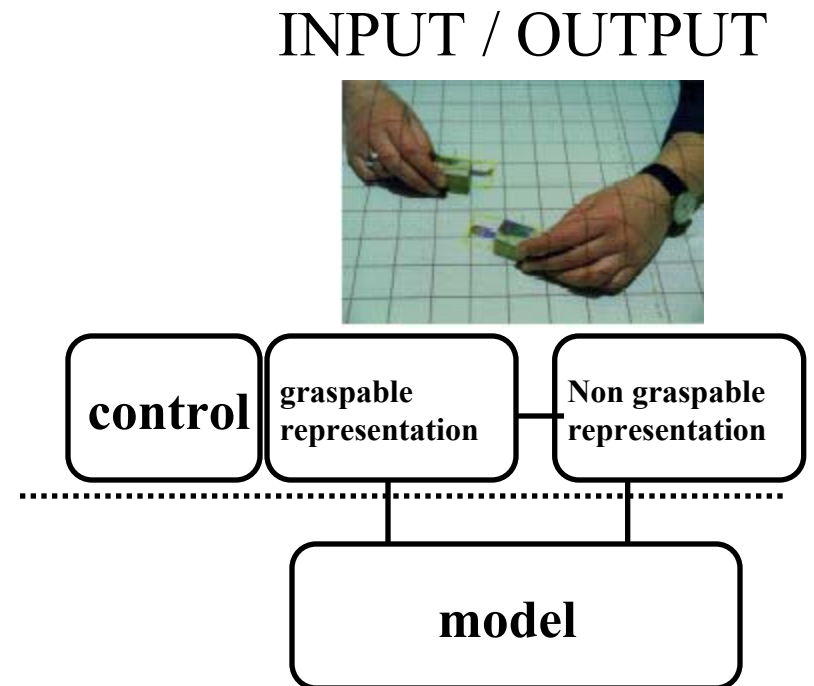
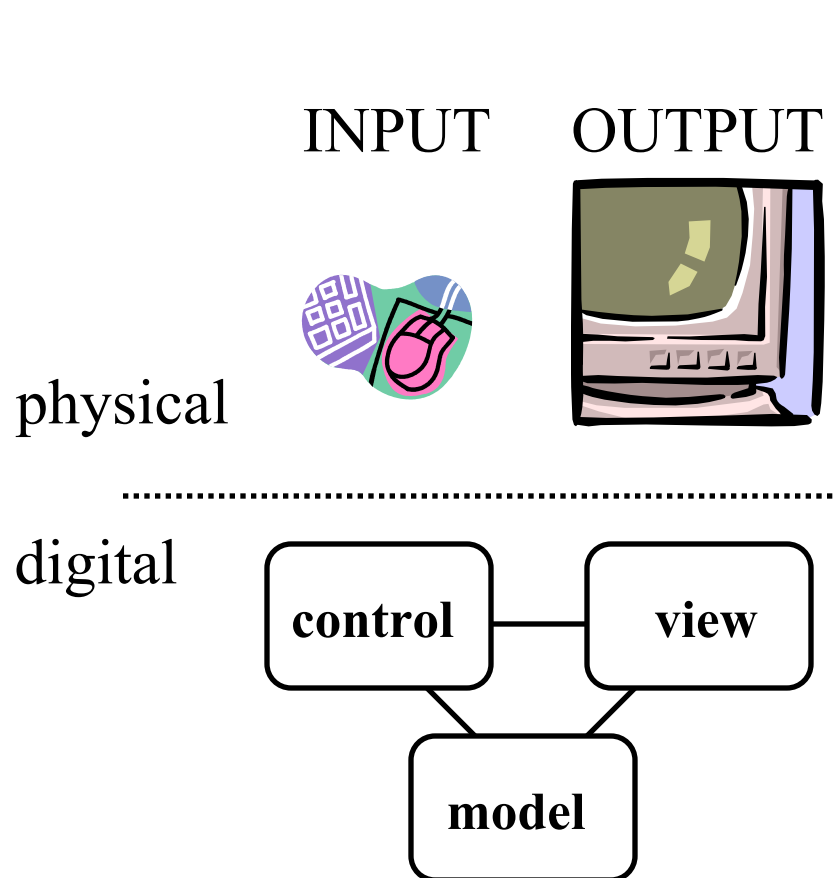
# Empirical Results: Playing time per game



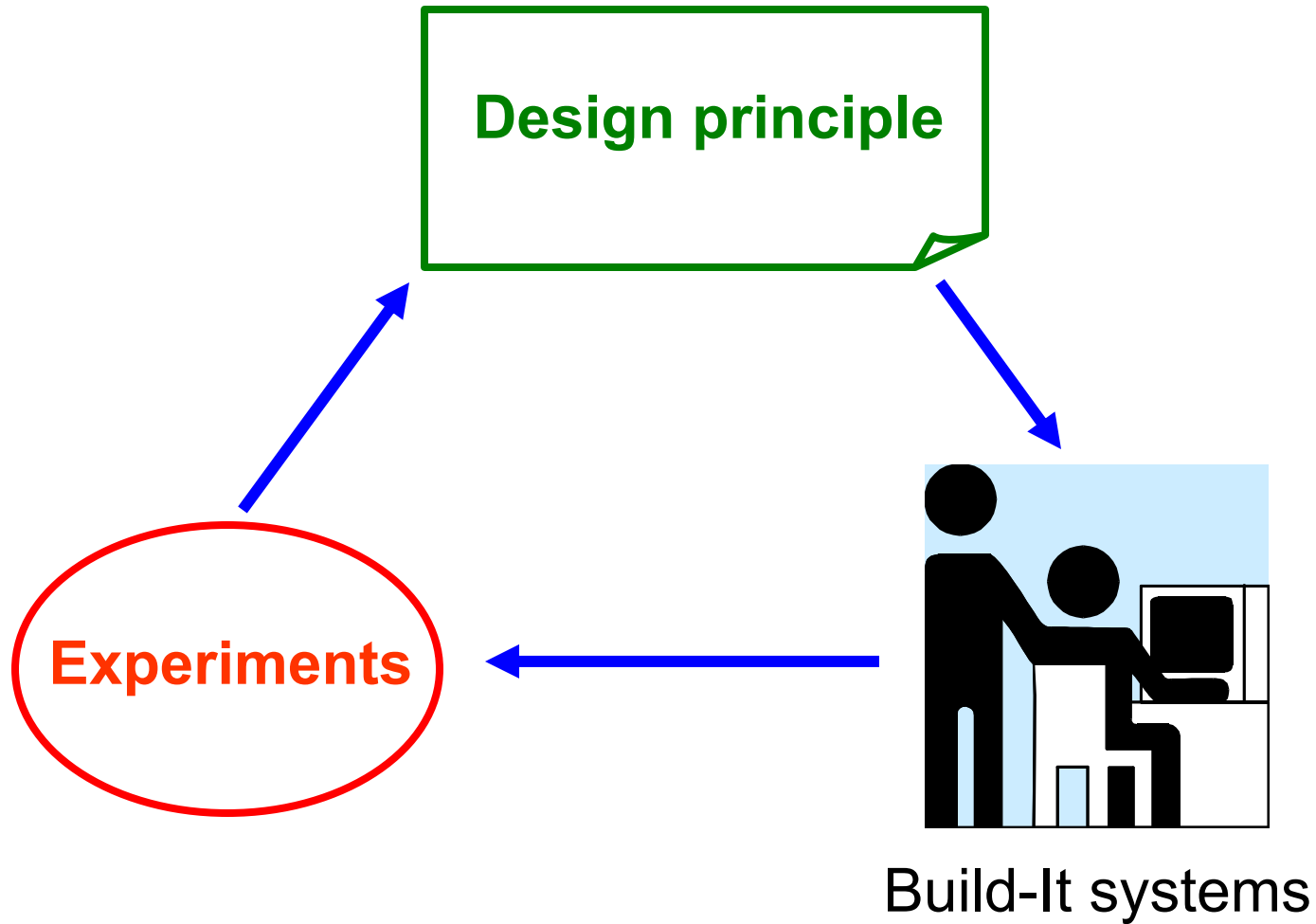
# Empirical Results : winning chance per dialog technique



# GUI versus NUI interaction models



# NUI: The Second Round





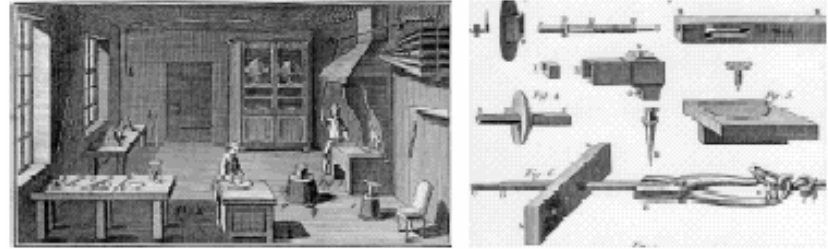
# The Build-It System

from M. Bichsel, M. Fjeld & M. Rauterberg 1997



# The Build-It Tools

18th Century: tool production



# Past and Future Developments

- Patent pending
- Spin-off company TELLWARE founded in October 1997
- First brick-based planning systems on the market since 1998
- Winner of the Swiss Technology Award 1998

