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Reality Based Interaction: A New Framework for Understanding the Next Generation of Human-Computer Interfaces

Professor Robert Jacob
Grad Students: Erin Treacy, Audrey Girouard, Leanne Miller

Objectives:
• Understand and compare forms of human computer interaction that characterize the emerging generation of “reality based interaction”
• Design, implement, and evaluate new next-generation user interfaces that are reality based
The Next Generation of Interaction Styles: Reality Based Interactions

<table>
<thead>
<tr>
<th>GUI</th>
<th>VS</th>
<th>RBI</th>
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<tbody>
<tr>
<td>• Graphical User Interface</td>
<td>• Reality Based Interfaces</td>
<td>• Reality Based Interfaces</td>
</tr>
<tr>
<td>• Learned Skills</td>
<td>• Innate Skills</td>
<td>• Innate Skills</td>
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<td>ex. Menus, line commands</td>
<td>ex. Pointing to click</td>
<td>ex. Pointing to click</td>
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Explicit RBI

• Interface mimics the environment
  ex. Virtual reality

Implicit RBI

• Design choices are based upon familiar qualities
  ex. Smartboard
Offshoot Of RBI Research

In collaboration with Sergio Fantini
Prof of Biomedical Engineering
Specialty: Medical Optics
Current Work: fNIR
fNIR

Functional Near Infrared Optical Brain Imaging

Method of measuring the level of neuronal activity in the brain
OBJECTIVE:
Measure workload capacity while counting colors on a rotating physical and GUI block using fNIR technology.

Connecting fNIR sensors

Workstation set up
Our Experiment (cont.)

3 Different workloads → 3 Different Blocks
(Both physical blocks and GUI blocks)

2 Colors
Low Workload

3 Colors
Optimum Workload

4 Colors
Work Overload
Experiments produce graphs depicting participants mental workload

Gives a reference for mental workload

With this information we can use fNIR to test interfaces and compare the data to our reference workloads
Questions?