

## Levels of Research in Interaction Design

This outline is meant to illustrate types of research questions from very general to highly specific. Specific research efforts (e.g., funded projects, dissertations) typically have an “hour glass” organization, embedding fairly specific investigations in more general layers of research problems, using the specific results to then generalize to the global issues. These examples are meant to be illustrative rather than exhaustive!

### Level 1.

- 1.1. What is the nature of interactivity? Why is it appealing to humans? When is it useful/harmful?
- 1.2. How do systems augment cognition? Behavior?
- 1.3. How do media influence performance? Thought?
- 1.4. What are the physiological, cognitive, and affective components of interaction?
- 1.5. What is the nature of design? What processes are involved?
- 1.6. How do we evaluate interaction? Design?

### Level 2.

- 2.1. How can we quickly and effectively elicit/clarify user needs (the 2 question question)?
- 2.2. What structure and process (representation and mechanisms) do users need to interact successfully? How can we best communicate structure and process to users?
- 2.3. Are universal interfaces possible? Desirable? Can interfaces serve multiple populations? Tasks (e.g., learning, work, entertainment)?
- 2.4. How do we evaluate interfaces? Are there general metrics?
- 2.5. What design principles work best? Are there alternatives to iterative design?
- 2.6. Can there be paradigm shifts/breakthroughs that are not driven by technology? What is the interplay between theory and practice?
- 2.7. How do representations and control mechanisms combine to determine performance?

### Level 3.

- 3.1. What is the best mix of user control and adaptation to facilitate interaction?
- 3.2. What representations (surrogates) are useful for searching? Browsing? (e.g., 2d vs 3d)
- 3.3. What control mechanisms are best for which representations? Tasks? Users?
- 3.4. How can user disorientation be minimized? Distraction? Overload?
- 3.5. How do searchers leverage memory of previous searches and previous steps in the current search?
- 3.6. How can we provide overviews and previews for digital libraries?

### Level 4.

- 4.1. What is the optimal zoom speed range for text browsing?
- 4.2. What is the optimal video slide show rate range for video browsing?
- 4.3. Which video surrogate is best for quickly selecting candidates for further processing? For understanding gist?
- 4.4. How can dynamic query visualization displays be scaled up (technical and conceptual solutions)?
- 4.5. How can search session history be captured and made available?