Designing with the Mind in Mind: The Psychological Basis for UI Design Guidelines

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ABSTRACT

UI design rules and guidelines are not simple recipes. Applying them effectively requires determining rule applicability and precedence and balancing trade-offs when rules compete. By understanding the underlying psychology, designers and evaluators enhance their ability to apply design rules. This two-part (160-minute) course explains that psychology.

CCS CONCEPTS

• **Human-centered computing** → HCI Theory, concepts and models.
• **Human-centered computing** → Interaction design theory, concepts, and paradigms.

KEYWORDS

Psychology; perception; cognition; memory; learning; attention; design; user interface; user-centered design; interaction; user experience; human-computer interaction; design guidelines; design heuristics.

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BENEFITS

User interface design principles, guidelines, and heuristics (collectively called "design guidelines") have a basis in the psychology of human perception, learning, memory, and problem-solving. Unfortunately, people who design and evaluate user interfaces usually learn the design rules without understanding their psychological basis.

UI design guidelines are not simple recipes to be applied mindlessly. Applying them effectively requires determining their applicability (and precedence) in specific situations. It also requires balancing the trade-offs that inevitably arise in situations when design rules appear to contradict each other.

By understanding the underlying psychology for the design rules, designers and evaluators enhance their ability to interpret and apply them. Explaining that psychology is the focus of this course. The first part focuses on perception; the second focuses on cognition.

INTENDED AUDIENCE

This course is intended for software designers and developers of all experience levels, especially those who did not take perceptual and cognitive psychology in college or who want to update their knowledge of it. Others who may benefit: Software Q/A engineers, usability testers, development managers.

PREREQUISITES

None.

CONTENT

This course covers the following topics (with approximate times):

Introduction (5 mins)

Perception (75 mins)

Perception is biased by experience, context, goals
Vision is optimized to perceive structure (Gestalt principles)
We seek and use structure
Color vision is limited
Peripheral vision is poor, and visual search is linear unless target "pops" in periphery

Cognition (75 mins)

Reading is unnatural

Attention is limited; Memory is imperfect

Limits on attention and memory shape our thought and action, e.g., change-blindness

Recognition is easier than recall

System 1 vs. System 2 (per Kahneman, *Thinking Fast & Slow*, 2013)

Easy: learning from experience, and executing learned actions; Hard: novel actions, problem-solving, and calculation

Hand-eye coordination follows rules

Summary, Q&A, wrap-up, evaluations (5 minutes)

PRACTICAL WORK

The course includes many engaging visual examples and demonstrations, and brief audience exercises.

INSTRUCTOR BACKGROUND

Jeff Johnson is a Professor in the Computer Science Department of the University of San Francisco. After earning B.A. and Ph.D. degrees from Yale and Stanford, he worked at Cromemco, Xerox, US West, Hewlett-Packard Labs, and Sun Microsystems. In 1990, he co-chaired the first Participatory Design conference, PDC'90. He serves on the SIGCHI U.S. Public Policy Committee. He has also taught at Stanford University and Mills College, and in 2006 and 2013 he taught HCI as an Erskine Fellow at the University of Canterbury in New Zealand. He is a member of the ACM SIGCHI

Academy and a SIGCHI Lifetime Achievement in Practice Awardee. He has authored or co-authored many articles and chapters on Human-Computer Interaction, as well as the books *GUI Bloopers*, *Web Bloopers*, *GUI Bloopers 2.0*, *Designing with the Mind in Mind*, *Conceptual Models* (coauthored with Austin Henderson), *Designing with the Mind in Mind, 2nd edition,* and *Designing UIs for an Aging Population* (with Kate Finn).

RESOURCES

[1] Johnson, J. (2014) *Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines, 2nd Ed*, Morgan Kaufmann Publisher.