**Study Guide for Midterm in INFSCI 0410**

The questions will be multiple choice and True/False. Also, there will be some questions where none of the answers match. This guide may not cover every question but it will cover most of them. Scan this whole document first as it also mentions what NOT to study. The test will be timed and has 63 questions – there will not be time to look up answers.

Keep in mind you are typically looking for the “best” answer. In other words read the question carefully, look at each answer, check off the ones that are definitely wrong and then select the right answer.

This document is organized to match the modules that are in Canvas. You should focus your study on the:

1st: Slides, labs and home works

2nd: Readings are a secondary support

3rd: On-slide web URL’s (videos) help in providing real life examples.

**Week 1 and Week 2 - Theory**

**You should know:**

* The definition of interaction design, fields that contribute to it and how it has grown

Diagram

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* Affordances – what is it? What would be an example?
* An affordance refers to the relationship between the properties of a person and the perceptual properties of an object in the environment
* Refers attributes of objects that allow people to know how to use them.
  + The affordances of an object are perceptually obvious, they make it easy to know how to interact with the object (e.g., door handles afford pulling, cup handles afford grasping).
* What are basic characteristics of: **Paradigms**, Theories, Models and Frameworks
* Paradigm: general approach that has been adopted by a community of researchers and designers for carrying out their work, in terms of shared assumptions, concepts, values and practices
* Theory: well-substantiated explanation of some aspect of a phenomenon
  + Theory of information processing that explains how the mind, or some aspect of it, is assumed to work
* Model: simplification of some aspect of HCI, intended to make it easier for designers to predict and evaluate alternative designs
* Framework: set of interrelated concepts and/or a set of specific questions that is intended to inform a particular domain area, (e.g., collaborative learning, online communities) or an analytic method, (e.g., ethnographic studies)
* Know definitions of Classical, Modern and Contemporary Periods
* Classical: refers to the 1980s, when classical cognitive theories were derived from cognitive psychology for modeling and analytic purposes.
* Modern: refers to the 1990s and early 200s when theories and frameworks were taken from many disciplines to address problems.
* Contemporary: refers to everything since then.
  + Read to understand. For example: Is there a clear boundary to each of these periods, in other words there is no overlap, is that true?
* Have basic understanding of cognitive theory, ecological approach, situated action, ethnography, CSCW, situated action and activity theory.
* Cognitive theory: provision of explanations of the capabilities and limitations of users, in terms of what they can and cannot do when performing computer-based tasks
  + For example, theories that were developed to address key areas, like memory, attention, perception, learning, mental models and decision-making, have been much popularized in tutorials, introductory chapters, articles in magazines and the web
* Ecological approach: notion of invariant structures in the environment and how they relate to human perception and action.
  + Two that were considered most relevant to HCI were ecological constraints and affordances.
* Situated action: offers detailed accounts of how technology is used by people in different contexts, which can often be quite different from the way the technology was intended to be used
  + The method used to reveal these discrepancies is predominantly ethnographic (i.e., carrying out extensive observations, interviews, collecting video and note taking of a particular setting)
  + Findings are contrasted with the prescribed way of doing things, i.e., how people ought to be using technology given the way it has been designed
* Ethnomethodology: concerned with how people accomplish social order in their everyday and work settings.
* Activity theory: explains cultural practices (e.g., work, school) in the developmental, cultural and historical context in which they occur by describing them in terms of “activities.”
  + Hierarchical model of activity that frames consciousness at different levels
    - Operations, actions and activities

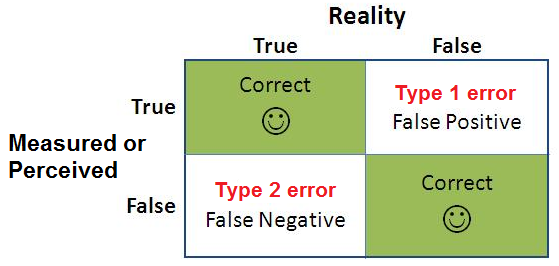
**You do \*not\* need to know**

* Schneiderman framework of direct manipulation
* Hutchin’s framework of directness
* Norman’s theory of action
* Distributed Cognition
* Grounded Theory

**Week 3 and Week 4 Research Design**

**You should know:**

* What is descriptive vs Inferential Statistics
  + Descriptive: describes a population, situation or phenomenon being studied
    - How, what, when, and where, not why
    - Observation and focus groups to discover opinions
  + Inferential: take data from samples and make generalizations about a population
* What is relational research
  + Relationship between two or more variables
  + More significant than descriptive, but does not prove X causes Y
* Variables: Independent and dependent
  + Independent: controlled by the researcher
    - Relation to technology
    - Relation to users
    - Relation to context of use
  + Dependent: outcome variables
    - Efficiency
    - Accuracy
    - Subjective satisfaction
    - Ease of learning and retention rate
    - Physical or cognitive demand
* Hypothesis : Null, Alternative, definitions
  + Precise, can be empirically tested
  + Simple: prediction of relationship between independent and dependent variables
  + Complex: examines relationship between two or more independent variables and two or more dependent variables
  + Null: used when there is possibly no relationship between two variables being studied
    - Work to reject the null hypothesis
    - Alternate hypothesis explains the phenomenon
    - There is “no difference” between the two test conditions
* What are Type I and Type II errors



* Triangulation definition
  + Multiple researchers use multiple methods to investigate the same phenomenon
* What are the steps of a research experiment
  + Theory
  + Research methods
  + Participants/context
  + Statistics/analysis
  + Implications for interfaces
* What was the Belmont report
  + Guidelines for working with human subjects
    - Respect for persons
    - Justice
    - Beneficence
* What are plus and minus of between and within group testing
  + Between: one participant only experiences one condition, if there are any differences between groups, then it was due to the independent variable
    - Advantages: no learning across conditions, simpler to set up
  + Within: one participant experiences multiple conditions
    - Advantages: fewer participants

**You do \*not\* need to know**

* Main Effect
* Interaction Effects
* HCI research eras

**Week 5 Data and Stats (Includes Testing)**

**You should know:**

* The four types of data: Nominal, Ordinal, Interval and Ratio
* Significance – its definition and application
* What is a p value and how do you interpret it.
* What do you do with missing data
* What is a T test and when is it used ( hint: between groups and continuous dependent variable)
* What is a Chi Square Test and when is it used
* What is a Regression test and when is it used
* What is a Pearson’s Product Moment Correlation Test and when is it used
* What are measures of Central Tendency
* What is a paired T-Test and when is it used

**You do \*not\* need to know**

* about ANOVA tests
* about how to use SPSS

**Week 6 Data Collection**

**You should know:**

* What are surveys and what are plus and minus
* What are diaries and what are plus and minus
* What are interviews and what are plus and minus

**You do \*not\* need to know**

* Probabilistic and non-probabilistic sampling
* Feedback and elicitation
* Critical Incident Analysis
* Participatory Design

**Week 7 Usability and Interfaces**

**You should know:**

* What is usability testing
  + Uncover problems in the design
  + Discover opportunities
  + Learn about user’s behavior and preferences
  + Users perform interface tasks to identify and fix flaws early
    - Identify features that are problematic, unclear, or could be improved
    - Not about general styles preferences rather interface components that impact performance and frustration
* How is usability testing different than traditional research

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* What are three types/approaches of usability testing
  + Expert-based testing (inspections)
  + Automated testing (software tools)
  + User-based testing
  + Formative testing
  + Summative testing
  + Validation testing
* What is ideal number of users
  + Get as many as affordable in the timeframe given
  + Be practical and find major flaws in the interface
* Command line, Icons, and VR
  + Command lines: efficient, precise, fast, but large overhead to learning commands
    - Considerations: reduce the learning curve of new users, reduce error rate, and structure or naming techniques
  + Icons: easier to learn, compact and variably positioned
    - Similar, analogical, or arbitrary
  + VR: computer generated simulations aimed to create a synthetic environment
    - Different viewpoints, engrossing, but uncomfortable and disorienting

**You do \*not\* need to know**

* Stages of usability testing