

Name: Sid

Student ID Number: _____

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EECE 418 2009 Midterm Exam

Department of Electrical and Computer Engineering

University of British Columbia

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Exam Instructions (read carefully):

1. Sign the first page of the exam with your **signature** in the space provided on the upper left **immediately**.
2. Continue reading the instructions, but **do not open the exam booklet** until you are told to do so by a proctor.
3. Print your **Name** and **Student Identification Number** on every page in the space provided at the top of each page **before you start the exam**.
4. Cheating is an academic offense. Your signature on the exam indicates that you **understand and agree** to the University's policies regarding cheating on exams.
5. Write **all** of your answers on these pages. If you need more space, there is blank space at the end of the exam. Be sure to indicate when a question is continued, **both** on the page for that question and on the continuation page.
6. The exam is **closed book**. There are **no aids permitted**, except for a calculator *and 1 page notes sheet of 1 side ok.*
7. You have **60 minutes** in which to work. **Budget your time wisely.**
8. No one will be permitted to leave the exam room during the **last ten minutes** of the exam.

| Section | Points | Received |
|---------|--------|----------|
| 1 | 13 | |
| 2 | 40 | |
| 3 | 36 | |
| 4 | 16 | |
| 5 | 28 | |
| Total | 133 | |

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Section #1: Design Process [13 points]

1) What are 4 fundamental components of creating a problem definition [8 points]:

- a) identify the human activity
 - b) identify the people/users
 - c) set the level of support
 - d) select the basic form of solution.
- O statement of concern

2) Circle all the activities that are required during a brainstorming session. [5 marks; 1/2 mark for either correct answer or rejection].

- ☒ a) Assign a facilitator.
- ☒ b) Assign a note-taker.
- ☐ c) Assign a referee.
- ☐ d) Separate impossible ideas from good ideas.
- ☒ e) Create a list of topics and questions.
- ☒ f) Switch topics when ideas slow down.
- ☐ g) Encourage quality ideas.
- ☐ h) Switch topics when one person comes up with a good idea.
- ☒ i) All ideas have equal worth.
- ☐ j) Spend 5-10min criticizing ideas before moving on to next topic.

Section #2 Prototyping [40 points]:

- 3) Pretend you are designing a new cell phone. You have a list of specific questions about the usability of your design. For each of the following questions, i) indicate what level of fidelity of prototype is appropriate and ii) describe a prototype you could build to answer that question reliably but with minimum effort/overhead [16 pts total]:

- a) Can users figure out how to turn off the power [4 pts]?

i) low fi
 ii) paper proto of look of design; drawing of i/f

- b) Do users know where to find specific addresses within the address book menu [4 pts]?

i) ~~low fi~~ ~~med fi~~ ~~high fi~~ - need to - power point or flash of storyboard
 ii) paper proto of the address book fn', navigation panes recreated.

- c) What size font do users find the most readable for default GUI text [4 pts]?

i) low fi / med fi
 ii) paper proto of screens - need different font sizes replicated in actual fonts.

- d) Can users figure out how to sync their calendar with the Bluetooth connection [4 pts]?

i) ~~low fi~~ ~~med fi~~ ~~high fi~~ need fi
 ii) replicate some of screens on computer, may have to take actual sync, will need failure modes

4) List four elements of the WIMP interface? [8 points – 2 pts each]

- i) Windows
- ii) Icon
- iii) Menus
- iv) Pointers

5) List 4 of the six main styles of help that designers may provide for users? For each style, provide a specific example of it [16 points: 2 points for each style, 2 for each example].

eg 395-403

i) Style: _____

Example:

1. Command assistance
ex: help x i.e. man page

ii) Style: _____

Example:

2. Command prompts
ex: correct usage info after error

iii) Style: _____

Example:

3. Context sensitive help
ex: roll over, what's this?

iv) Style: _____

Example:

4. Online tutorials
ex: video of how to do some function

5. Online documentation
ex: help menu item - index + info

for wizards and assistants
ex: install wizard, floppy.

Section #3 Pre-user studies and goal for the UI specifications [36 points]:

- 6) Often, designers are forced to use non-user-based methods because of time & money limitations.

Describe **2 other situations** when it might make sense to use non-user-based methods [4 pts total]:

- no access to subjects - no existing users.
- well understood problem

7) **Heuristic evaluation:**

- a) Heuristic evaluation has two main deliverables to the design team. Please list them below [4 pts]

1. compiled report listing problems & severity & recommendations
2. individual evaluations

- heuristic list
- severity & freq

- b) What 2 characteristics should a heuristic evaluator have? [4 pts]

- not be part of team
- experienced person

- care for detail ①

- c) Give a specific example of a design element/strategy that demonstrates good error prevention [2pts].

- calendar entry that uses a calendar to select date

- d) What is the difference between a mistake and a slip [4 pts]?

mistake - conscious deliberations leading to an error
slip - unconscious behaviour that gets misdirected

- e) Describe the following slips and one technique to prevent them [16 points – 2 for description, 2 for example]:

i) Capture error:

Description: frequent response over modes mistaken one

Example: hitting "Yes" to overwrite file since this action is done all the time
- are you sure question.

ii) Description error

Description: intended action has too much in common with others

Example: Save + quit button are close to each other
- put in separators or colours

iii) Loss of activation

Description: forgetting goal while doing action

Example: go to room and forget why you went there
- keep list of actions on screen.

iv) Mode error

Description: actions in one mode but act in another

Example: Vi editor
- have ^{background} colour to indicate mode

- f) What does the heuristic, "recognition rather than recall" refer to [2pts]?

- people can recognise action easier than recalling it.
i.e. items on menu can be selected, but can it be remembered.

Section #4: User-Centred Design Methods [16 points]**8) Contextual Design:**

- a) Contextual design is a structured process for design of technology within the context of the environment of use, usually a workplace. Phase 1 is called contextual inquiry, in this phase the designer tries to understand the context of use of the proposed design. In this phase, what role does the designer play in relation to the user? [4 pts]

-partner 1/2 between interviewer and observer.

- b) Which one of the following methods **must** be used in contextual inquiry? [2 pts]

- i) Passive observation
- ii) Video recording
- iii) Heuristic analysis
- ☒ iv) Interviewing
- v) Cognitive walkthrough
- vi) User testing

- c) What happens in Stage 2 of contextual design (name and brief description)? [2 pts]

work modeling

- d) What is its goal? [2pts]

encapsulate + document understanding from study

- e) What happens in Stage 3 of contextual design (name and brief description)? [2 pts]

work consolidation

- f) What is its goal? [2 pts]

abstracting insights from study

- g) What is an affinity diagram? [2 pts]

tool to organize data to find common concepts/insights.

Section #5: Mental Models [28 points]

9) Norman's seven-stage model:

- a) In Norman's seven-stage model which steps are responsible for the gulf-of-execution (circle all that apply [4pts]):

optional ☒ A) establishing goals

B. evaluation of interpretation

☒ C) sequence of actions

D. perceiving the state of the world

☒ E) execution of the action sequence

☒ F) intention to act

G. interpreting the perception

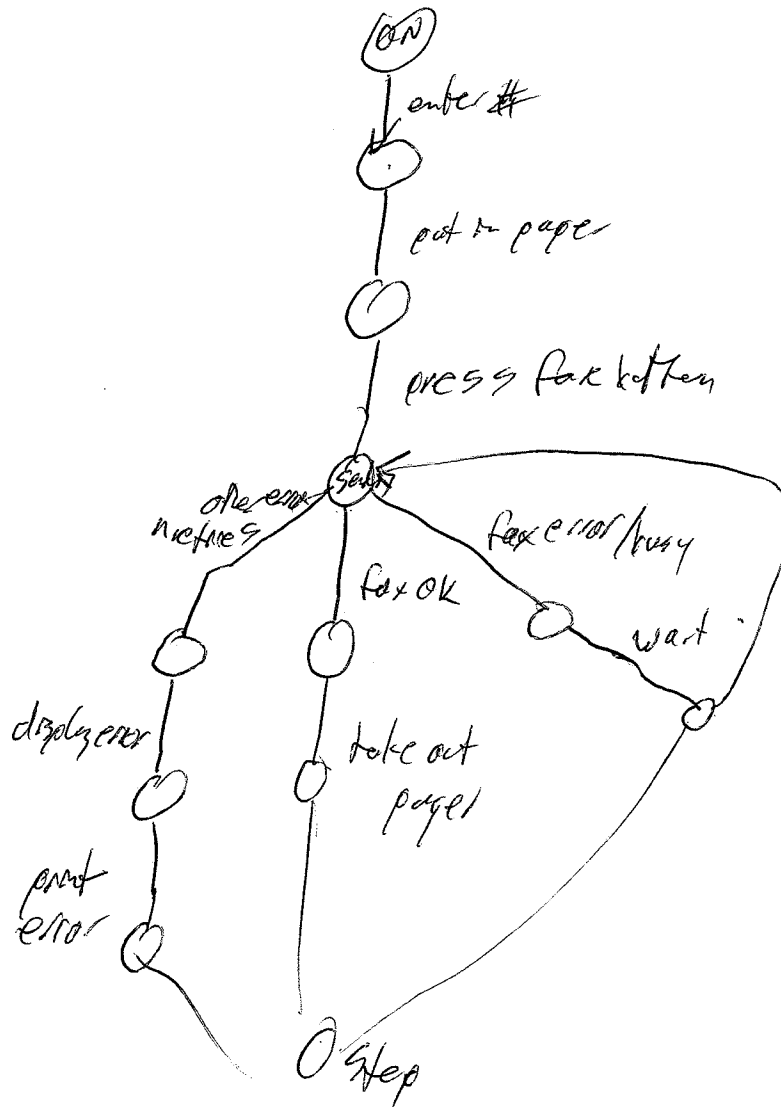
b) What does the gulf-of-evaluation mean [4pts]?

The gap between seeing a result in the world and knowing whether it helped achieve your goals.

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- c) Draw a mental model of sending a fax using a typical fax machine (State any assumptions you make) [12pts].



- 10) The **Interaction Framework** attempts to provide a more realistic description of the interaction compared to Norman's seven stage model by including the system explicitly. There are four main components as shown in figure X. Indicate the translations that occur between each of the four components in the interaction framework [8 points].

