- A Partially Asynchronous Approach to Support Personalized Learning for a Diverse Student Population Dr. Bowen Hui
- **Computer Science**
- University of British Columbia Okanagan Project funded by the

Aspire Learning and Teaching fund, UBCO

Course Context and Challenges

- COSC 341: Human Computer Interaction
 - Prerequisite:

• 3rd year standing *previously* • COSC 111 Computer Programming 1 *now*

- Core for all CS majors
- Cross-listed COSC 541 (graduate level)
- Well documented in HCI education literature
 - Students come with negative preconceptions
 - Grading is too subjective
 - Work not challenging enough
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Focus on Personalized Learning

- Redesign goals include:
 - 1. Modularize course content
 - Make modules reusable for other courses
 - Create a bank of modules to allow student choice 2.
 Allow for flexible learning opportunities
 Students can choose what content they learn
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Course Modularization



• Every week follows this M/W/F structure

Recommended Study Schedule

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List of Modules Developed

- 0. Intro to HCI and Course Logistics
- 1. User Centered Design
- 2. Multiple Designs
- 3. Good Design
- 4. Prototyping
- 5. Formal Models
- 6. Alternative User Interfaces
- 7. Usability Evaluation
- 8. Heuristic Evaluation
- 9. Controlled Experiments

Media/Creative

- 10. Course Summary
- 11. Accessible Design

Studies Engineering	Gr. 7-9 ADST
Data Science	Gr. 10-12 ADST
Computer Science	

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Other Course Components

- Programming Project
 - Goal: Full software development cycle on small UI component, from design, to implementation, to evaluation
 - Broken up into 9 smaller assignments
 - Deadlines
 - Recommended to be done weekly
 - A1-A4: due after reading week
 - A5-A9: due last week of classes

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How It Worked on Canvas: Modules

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Account

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Calendar

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Help

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2020W2	COSC 341 COSC 541 101 2020W Human Computer	1 Import Existing Content
Home	Interaction	© Import from Commons
Modules		Choose Home Page
Assignments		ක් View Course Stream
Quizzes	Welcome to COSC 341	() Course Setup Checklist
Discussions	Human Computer Interaction	다 New Announcement
Grades	Human computer interaction	I≦ New Analytics
People		O View Course Notifications
Pages Zoom	simple preferences mobile interviews user feedback participatory	To Do
Collaborate Ultra (previous recordings only)	s modeling predictive allysis mixed rationale eye tracking touch evaluation direct manipulation direct manipulati direct di direct direct direct d	Grade 341 Background Survey 0 points • Jan 17 at 11:59pm
New Analytics	intelligent user interfaces accessibility speech	Grade Main Activity for
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Media Gallery	Evaluation Criteria	
My Media	Table 100%	Coming Up

Example Module

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3 View Calendar

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H	• M	odule 2 [[~45 min, excluding pre/post-tests]]	Prerequisites: Module 1 [[-40 min, excluding pre/post-tests]]	Complete All It	ems
				⊘ +	:
	\$2	Pre-Test 2 [[~10 min]] Jan 27 3 pts Submit		ø	:
		Module 2: 1. Bad Design		ø	:
	P	Module 2: 2. Functional Fixation		0	:
		Module 2: 3. Experiment Solution		ø	:
	P	Module 2: 4. Parallel Design View		0	:
	P	Module 2: 5. Design Rationale		ø	:
	\$8	Post-Test 2 [[~10 min]] Jan 31 3 pts		ø	:
	P	Module 2: 6. Optional - HCI/UX Interview Series [[~7	min]]	ø	:

https://canvas.ubc.ca/courses/64290/pages/module-2-1-bad-design?module_item_id=262822

2 15

Reading Logs

#	 Reading Logs 			
=	P	Logs Module 0 Closed Due Jan 17 at 11:59pm 1 pts		
	Ð	Logs for Module 1 Closed Due Jan 22 at 4pm 1 pts		
	2	Logs for Module 2 Closed Due Jan 29 at 4pm 1 pts		
	P	Logs for Module 3 Closed Due Feb 5 at 4pm 1 pts		
	P	Logs for Module 4 Closed Due Feb 12 at 4pm 1 pts		
	2	Logs for Module 5 Closed Due Feb 26 at 4pm 1 pts		

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How It Worked on Canvas: Tutorial Activities

i	 Tutorial Activities 				
	P	Tutorial Activity for Module 1 Closed Due Jan 20 at 11:59pm 7 pts			
=	2	Tutorial Activity for Module 2 Closed Due Jan 27 at 11:59pm 3 pts			
=	P	Tutorial Activity for Module 3 Closed Due Feb 3 at 11:59pm 5 pts			
=	R	Tutorial Activity for Module 4 Closed Due Feb 10 at 11:59pm 5 pts			
=	2	Tutorial Activity for Module 5 Closed Due Feb 24 at 11:59pm 6 pts			
	P	Tutorial Activity for Module 6 Closed Due Mar 3 at 11:59pm 5 pts			
-					

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Example Tutorial Activity

Exercise 3

Consider the two popup context menus. When the user right-clicks on the desktop, the context menu popups. The right dot shows where the current mouse cursor is. That means, with design (a), the context menu pops up roughly at the bottom right-hand corner of the cursor, while design (b) pops up directly under the cursor.



Use your knowledge about the various interaction factors to provide justifications for these designs. You may use a model or an interaction factor to explain why the design is good or bad in a certain context.

Exercise 4 [2pts]

According to Fitts' law, rank each of the design for a slider bar and explain your ranking. Pictures are to scale. You will want to consider the user selecting both the blue rectangular component for more coarse-grained movement (like sliding half a page over) as well as the blue arrows for fine-grained movements (like sliding just one pixel over).



Note: Don't forget to tell us which rank number is easiest and which rank number is hardest for access. (Some people use "1" to mean best but some use it to mean it's worst.)

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How It Worked on Canvas:

Main Activities

1	 • Ma	in Activities
1	P	Main Activity for Module 1 Closed Due Jan 24 at 11:59pm 8 pts
	Ð	Main Activity for Module 2 Closed Due Jan 31 at 11:59pm 5 pts
	 P	Main Activity for Module 3 Closed Due Feb 7 at 11:59pm 7 pts
	 P	Main Activity for Module 4 Closed Due Feb 14 at 11:59pm 12 pts
	P	Main Activity for Module 5 Closed Due Feb 28 at 11:59pm 12 pts

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Example Main Activity

Module 2 Main Activity [5pts]

What to Submit:

QOC analysis in PDF

Application Scenario

Suppose we wish to develop a step counter app for an Apple watch. The first thing you should note that is that the screen real estate is extremely limited. In terms of physical size, the watch is approximately 40mm by 40mm, and supports approximately 370 pixels by 450 pixels.

The step counter app should count steps each day. Let's say the person wearing the watch is active, or wanting to get active. So we are likely to look at numbers in the range of 1,000 steps to 20,000 steps per day. That means, when you are developing your design, make sure to use numbers in that range.

Let's narrow in on our users. Your users are interested in playing games and having mini-competitions with friends. On a given day, your users can connect with one other friend and compete to see who has taken more steps. Your task is to evaluate the designs for the reporting screen that shows the number of steps for your user and the friend at the end of the day.

Below are three screen mockups for this report. Complete a QOC analysis. Make sure the criteria you write have supporting explanations (full sentences) so the reader can understand what you mean. Be sure to indicate the best design option at the end of your analysis.

You have taken 8,324 steps today. Your friend has taken 9,000 steps.



Pre/Post-Tests

∗ As	signment Quizzes		
\$3	Pre-Test 1 [[~20 min]] Closed Due Jan 20 at 10:30am 7 pts 7 Questions	0	:
\$3	Post-Test 1 [[~20 min]] Closed Due Jan 24 at 11:59pm 7 pts 7 Questions	0	:
\$3	Pre-Test 2 [[~10 min]] Closed Due Jan 27 at 10:30am 3 pts 3 Questions	0	:
\$3	Post-Test 2 [[~10 min]] Closed Due Jan 31 at 11:59pm 3 pts 3 Questions	0	:
\$3	Pre-Test 3 [[~15 min]] Closed Due Feb 3 at 10:30am 5 pts 5 Questions	0	:
\$3	Post-Test 3 [[~15 min]] Closed Due Feb 7 at 11:59pm 5 pts 5 Questions	0	:

Example Test Question

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Question 1

Below is a picture of two buttons used to control an emergency door. The red button is to open the door, and the green button is to close the door. Why might this be an example of a bad design?



There is nothing wrong with the design because these are just buttons and it is fine to
use any colour since the buttons are labeled anyway.

O There is nothing wrong with the design because these are just buttons and it is fine to use any colour because colours do not have pre-defined meaning to them anyway.

In many cultures, red is usually used to mean "stop", like how it is used in a traffic light. When we want to open a door, we usually want to walk through it, so we are more likely to associate that movement with green instead. It seems confusing that a person should "stop" when s/he wants to open the door.

Red is usually a colour used to grab one's attention. In an emergency where people always want to close doors, people will mistakingly press the red button even though they should be pressing the green buttons.

How It Worked on Canvas: Project

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1 pts

	• Pro	oject	+	:
	2	Assignment 1 [[< 0.5 hour]] Closed Due Feb 28 at 11:59pm 3 pts	0	:
	P	Assignment 2 [[~ 1 hour]] Closed Due Feb 28 at 11:59pm 4 pts	0	:
	2	Assignment 3 [[~4 hours]] Closed Due Feb 28 at 11:59pm 12 pts	0	:
I	2	Assignment 4 [[~4 hours]] Closed Due Feb 28 at 11:59pm 13 pts	0	:
1	2	Assignment 5 [[~4 hours]] Closed Due Apr 11 at 11:59pm 10 pts	0	:
l	P	Assignment 6 [[~8 hours]] if you have A4 working Closed Due Apr 11 at 11:59pm 18 pts	0	:
1	2	Assignment 7 [[~6 hours]] Closed Due Apr 11 at 11:59pm 12 pts	0	:
1	2	Assignment 8 [[~6 hours if you have A6 working]] Closed Due Apr 11 at 11:59pm 22 pts	0	:
1	P	Assignment 9 [[~4 hours, if you have A8 working]] Closed Due Apr 11 at 11:59pm	0	:

Example Project Assignment

Once all that's working, you can get the icon to grow or shrink as a function of that distance. Be sure to document within your code how your distance function works. Finally, make sure you do the same for each icon. And vollal
COSC 341: Project Assignment 6 - Expa Sector State State State
MORE VIDEOS
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Technique 2: Order by Frequency	
How does it work? Basically, the icon that is used the most based on the usage history moves to the top so it ends up being closes to the user's mouse. The idea is that if you use it so much, then it is likely something you will want to use again. This layout only makes sense if the icons were stacked vertically, so that's the layout we are going to use here. This type of adaptive interface is usually used with menu items (also displayed vertically).	
To start, my suggestion is to start with a working solution for assignment 4 or the expanding targets (if you did that one already augment the JS code as needed.) and
First, you will want to style the icons differently. In index.html, make sure the ImageDrawer is changed from a span to a div by u following:	sing the
<div class="ImageDrawer" id="iconDrawer"> </div>	

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Clear Rubrics Upfront

Marking Rubric

	No Submission	Below Expectations	Approaching Expectations	Meets/Exceeds Expectations
Revised HTA	[0] No submission, or content does not address the task required.	[1] HTA still has mistakes and inconsistencies.	N/A	[2] HTA has been revised and is consistent with the accompanying design.
Storyboard (instead of Video Prototype)	[0] No submission, or content does not address the task required.	[1] One or more storyboards are included. The storyboards do not show who the potential users are or why they would use the app. Pain points are not illustrated, so there is no molivation to use the app, and using the app does not bring satisfaction for the user. The specific task the app is meant to help with is not obvious.	[2] One or more storyboards are included. Some aspects about the users and their frustration may be shown. How the app is used, when the app should be used, or why the app should be used is not clear.	[3] One or more storyboards are included. The storyboards clearly illustrate the potential users and how the app is intended to be used. The way the app is used is shown clearly. The user's satisfaction is shown upon task completion. It is clear why users are motivated to use the app.
Video Prototype (instead of Storyboard)	[0] No submission, or content does not address the task required.	[1] The video does not show the problem at hand, or much of how the prototype is used to resolve the problem.	[2] The problem or potential frustration points are not clearly identified. The video shows some aspects of the prototype, but not completely. Some soreens are missing. Some narrative or context is missing or is not clear. The original problem at hand is not clearly resolved.	[3] The video shows how multiple users use the app to tackle their current problem. Using the prototype, the video shows how a user would initiate the event, elicit suggestions from friends, resolve conflicting interests/opinions, and finalize the event details. Narration and/or subtities may be used to make the context more clear. The video also shows the group of friends with a happy ending.
Paper Prototype or Digital Mockup	[0] No submission, or content does not address the task resulted	[1-2] The prototype is incomplete because not all the required functionality is supported. Some explanations are provided but they are inadequate and unclear.	[3-5] Most or all of the required functionality are supported in the prototype presented. Explanations are lacking or unclear.	[6-7] The prototype shows all the screens necessary to address the functionality required. Explanations are provided to illustrate how each screen works as well as the navigation of the screens. All the images are clear.

Student Feedback

- Some students completed modules weeks in advance
- One student mentioned a preference for
 - video lectures over text readings
 - Broader accessibility issue
- Class time was used to support those who needed it
- Consistent weekly structure worked well

for students

- Project assignments came as a surprise
- Generated a lot of interest in further studies



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TA Feedback

- Student contact hours roughly:
 - Office hours
 - Wednesdays tutorial support

- Fridays main activity support
- Discord Q&A
- Individual contact/email support (between 0-4 hours per week)

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Submission Statistics



Submission Statistics

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Mandatory Work

Submission Statistics

Start of Optional Work

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Optional Work

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Submissions with Project • elab

Project Success

Project Deadlines:

- Week 5

- Week 11

TA Grading Needs

- Tutorial grading (161 students)
 - Mostly 10-20 min each submission
 - 20% of class x 10-20 min = 5-11 hours per tutorial
- Main activity grading (38 teams)
 - Mostly 20-30 min each submission
 - 100% teams x 20-30 min = 13-19 hours per main activity
- Programming project grading (161 students)
 - Not enough prep time
 - More hours to help students
 - More hours needed for grading

Next Steps

• Modify TA duties in semester

Distribute programming assignments more evenly –
 Adapt grading needs based on previous # submissions –
 May provide insights on classroom needs

Offer on-demand one-on-one help

- Other evaluations to do
 - Student surveys on modules, course setup, topics of interest
 - Reading logs times

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Remaining Project Plan

- Original 3-year plan
- 1. Live lectures, video recording, content development, pilot module setup
- 2. Asynchronous lectures, additional modules 3. Asynchronous lectures, reduced classroom need
- Remaining steps
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- Develop "elective modules"
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- Less cumbersome way to collect reading logs 40

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