Interação Humano-Computador
Human-Computer Interaction
2021/2022

Assignment 2:
Design, prototyping and evaluation of an Interactive Application.

Introduction

This assignment is aimed at the development of an interactive application prototype following a user-centred design methodology. The work will be performed by groups of **three students**. The prototype shall be functional; however, simplifications may be done as the focus of the assignment is on the methods used along the **process** and the **User Interface** (UI) and not on having a fully functional application (leave out most of backend implementation).

Schedule and deliverables

Class # - Deadline		Deliverables (evaluation %)
Lab Class #5		**Deadline for project proposal** on shared link
P1, 3, 5, 7	05/04	
P2, 4, 6	07/04	
Lab Class #7		**Slides on requirements analysis** to **present and discuss** in Lab class (20%)
P1, 3, 5, 7	03/05	
P2, 4, 6	21/04	
Lab Class #8		**Low fidelity prototype** for testing during lab class.
P1, 3, 5, 7	10/05	**Usability test** of the application prototype in lab class, **improve prototype** (20%).
P2, 4, 6	21/04	**End of 1rst cycle. Deadline to select technology to develop functional prototype.**
Lab Class #11		**Usability test** of the application prototype in Lab class (15%)
P1, 3, 5, 7	31/05	
P2, 4, 6	02/06	**Analytical evaluation** of the prototype (5%)
Lab Class #12,13		**Final presentation and demo** (40%)
P1, 3, 5, 7	14&21/06	
P2, 4, 6	09&23/06	
23/06/2022		**Final submission** via Moodle ZIP should include**: Requirements analysis + final presentation + application code**

Project phases

Developing an interactive application involves a series of steps; a "user-centred design" approach shall be used. The final report shall cover all the phases of the project, namely:

1. Project selection/Task analysis

Each group (**three students**) will select a problem faced by some user population and will design, during the semester an application to address that problem. Two groups may select a similar topic (and conduct the Heuristic evaluation assignment on a system related to the selected project) but should create different solutions or focus on different aspects.

As much as possible, select a problem faced by a specific user population your group does not belong to since this will force you to learn about the users' needs and problems. Think about different people (specific professionals, mothers and fathers, …), different capabilities (children, elders ,…) and different contexts (swimmers, surfers, etc …). Specific HW for AR/VR and interaction is available and can be allocated for some work (HTC Vive, Kinect, Oculus Quest, Meta Glasses, etc…)

Each group shall interview at least 3 potential users to refine and analyse the problem at hands and identify at least three goals; if not possible, the problem may be too small for a good assignment and should be rethought.

The results of the assignment selection should be a short presentation with the following points:

- <u>Problem</u> - description of the problem to tackle.
- <u>Interviews</u> - Observations and Interviews performed (a brief description of the people you observed (avoid names but describe them in detail) and the main findings. Each group member should perform at least one interview.
- <u>Goals</u>: At least 3 users' goals (that might be different between groups) with a brief description for each.

This presentation will be integrated and delivered with the Requirement Analysis presentation (see section 2).

It is possible to combine this project with other courses such as the **PEI/PI** (Project in Informatics Engineering, Project in Informatics) by developing and evaluating the user interfaces in the HCI course.

Each group shall **submit** the proposal until **Lab class #4** through the following shared link:

https://docs.google.com/spreadsheets/d/1Cd6OFBVFOSCtopUwfn7mVIpI4Uk6Nr8H90Q58anZEhQ/edit#gid=1138834158

Selections will be regularly updated in the **final selection** webpage:

http://sweet.ua.pt/paulo.dias/IHC/TP2_Project_Selection/Project2_UIDesign_Selected.htm.

Any problems should be reported by e-mail to paulo.dias@ua.pt.

2. Requirement analysis (to be presented and discussed in Lab Class #7).

Based on the selected topics the group must perform a requirements analysis to better define the problem. It is necessary to define the application **target users (personas)**, **tasks** that can be performed and realistic **scenarios**.

- <u>Target users/persona</u> - develop at least one persona representative of your user.
- <u>Tasks</u> - Identify at least 3 "typical tasks" with a short description of each that will be the focus of attention when developing your prototype.
- <u>Scenarios</u> - write 3 short scenes illustrating the 3 tasks you identified. Scenarios are realistic stories involving a user goal and the necessary tasks he/she needs to perform to achieve the goal. They need to be detailed with personas and details to represent a realistic interaction with the system.

Each group must prepare a short presentation including the project selection (step 1) and requirement analysis (step 2) to be discussed in the lab class.

The presentation of requirements analysis will account for 20% of the final grade.

3. Low Fidelity prototype (to be tested in Lab Class #8)

Based on the previous analysis one **Low Fidelity prototype** (or several) shall be developed to test at least the three most representative tasks. The prototype shall be used in the lab class to test with users the conceptual model and the mentioned tasks (each student will alternate between observer in their own prototype test and user of other groups' prototypes).

This is the right time to test and validate **alternatives** and thus it might be interesting to test **several prototypes**. During the tests, changes might be **interactively** incorporated according to the users' comments and test results. Prototyping tools might be used in this phase, but that is not mandatory as paper prototypes present several advantages and do not involve learning new tools.

For this class you need to:

- build a **Low Fidelity prototype**
- prepare a small written introduction for the users
- **clearly** define **the scenario tasks** on separate cards. Tasks should not be too specific but **focus on the specific goal**. Each task should be **brief**, around 5 min to perform.

- **practice** using the paper prototype before the test.

The paper prototype must be **presented in the final Presentation** (photos or scans) as well as the results of this preliminary test (number of users, modifications, conclusions, statistics, etc…). You should present:

- Photos or print screen of the prototypes
- Scenario tasks
- Some statistics (number of user and other relevant information you collected)
- Main observations: problems user might have, incidents that happened, change you performed to the prototype
- Small analysis: Explain how you incorporated the feedback from the users in the final prototype.

The quality of the paper prototype, test and results will account for 20% of the final grade.

4. Functional prototype

A **prototype** shall be implemented following **usability principles** based on the previous study and results of the low-fidelity prototype tests. As the focus of this assignment is on the UI and not on the functionality, **simplifications** are **acceptable** (e.g., for an application implying a data base some hard-coded data is acceptable, images might be static/random, …). As mentioned, students may use other platforms besides Android Studio or HTML, if clearly justified and accepted by the lab classes' teacher.

The computer prototype should be:

- High fidelity in look: Use this prototype to explore the graphic design of your final implementation. Layout screens as you want them to appear in your final implementation. Make choices about colours, fonts, alignment, icons, and white space.
- Low fidelity in breadth: the prototype should include the feature specified in the requirement analysis but does not need any features beyond that.
- Low fidelity in depth: You can leave out most of your backend by using static images or random views. Use realistic data in your simulated views especially regarding scale (e.g. if you were building a MP3 player and your prototype displays only three songs in the user's library, that's unrealistic, and won't adequately test your UI design choices).

You should not worry with the following issues in the prototype:

- Window resizing: Determine a good default size for your windows and design a good layout for that size.
- Platform independence: Focus on one platform for now.

To ensure that your prototype fulfils most of the requirements, it is recommended to perform a **heuristic evaluation** of the prototype (either yourself or asking other students). The results of the heuristic evaluation, and the modifications introduced to the prototype should appear in the final presentation accounting for **5% of the final grade**.

Your implementation should have a **fully functional frontend**, with all the user interactions necessary to perform the main tasks. However, your implementation **does not need to have a back-end component**. As alternatives you might use hardcoded /random responses since the objective is to gain a frontend UI implementation experience.

5. Usability test (to be performed in Lab Class #11)

This class will be used to perform a **usability test of the application prototype**; each group shall act as observer for the usability test of their own application and as user in the test of another group application. The goal is to **detect implementation and usability problems**.

The test **preparation** (tasks, usability measures, questionnaire, etc.) and the obtained **results** (including some statistics such as means, medians, standard deviation, etc…) shall be presented in the **final presentation**.

For this class you need to:

- **prepare the briefing** and the tasks (adapting the ones from the paper prototype test). This also involve preparing some pre/post questionnaire (you might adapt the templates available at the course page)
- Run a pilot test previously.

The results of this test shall be included in the final presentation, namely:
- <u>Scenario tasks</u>
- <u>Some statistics</u> (number of user and information from questionnaire or logging you might have used)
- <u>Observations:</u> problems user might have, incidents that happened, change you performed to the prototype…
- <u>Analysis:</u> Explain how you will incorporate the feedback from the users in the final prototype.

Not having a minimally working prototype and not preparing the usability test to be performed in this class will imply a penalization in the final project grade.

The main results of the Usability tests must be presented in the final presentation, as well as a heuristic evaluation of the prototype.

The quality of the usability test will be evaluated in class and will accounting for 15% of final grade; the heuristic evaluation accounts for 5% of the final grade.

6. Final presentation, demo and submission

Each group shall make a 20-minute presentation of their work (plus 5 minutes for questions) in one of the last two Lab classes. The **final presentation,** as well as the **requirements analysis**, the **code** and possibly annexes of interest shall be submitted via **Moodle until June 23/2022 23:55** for **all students**.

The final presentation should include the following:
- Presentation of problem
- Summary of the requirements analysis
- Paper prototype images
- Paper prototype test results
- Main issues during the project (e.g., justification of choices, main difficulties, compromises, simplifications, etc…)
- Usability test results – Influence in the final prototype
- Final application description/demo
- Conclusions
- Specification of the percentage of work of each student to the assignment.
- Annexes of interest: questionnaire used in the evaluation, documentation, references…

Final Presentation and code delivery accounting for 40% of final grade

7. Assessment

The following scale will be used:
- 20% Requirement analysis
- 20%: Low fidelity prototype + reporting (in final presentation)
- 20%: Usability test + heuristic evaluation of the final prototype (in final presentation)
- 40%: Final presentation, demo and code.

Note - students who do not submit the assignment on time, cannot submit the same assignment in the 2nd deadline (Recurso), and will receive a new assignment to submit on the day of the 2nd exam (Recurso).

Bibliography

Some material in this document was adapted from MIT's 6.813/6.831 reading material, used under CC BY-SA 4.0.