

Handout for Example Classes 1 and 2

In Example Classes 1 and 2, you will design a **low fidelity (lo-fi) prototype** for public kiosks at an amusement park that will help visitors plan their activities. A fictitious scenario is described.

Scenario (Pre-COVID)

Faced with stiff competition from new tourist attractions springing up around the country, owners of the *Multiversal Studios* theme park have decided on investing in different ways to improve the experience of their visitors in order to continue drawing in the crowds.

Visitor feedback suggests that there are two negative aspects of their experiences. One is the long and seemingly unpredictable waiting times at some of the popular rides, which can range from 15 minutes to more than an hour depending on the time of day. A second negative aspect is that new visitors are often bewildered by the wide range of rides, shows and food options, and sometimes regret their choice of activities by day's end.

One idea proposed during a management meeting is to provide a substantial number of high-tech intelligent kiosks located throughout the park that will help visitors plan and get the best experience from the entire day. Each kiosk is capable of presenting the full range of activities to a group of visitors (e.g. a family) in the more appropriate format, and has an interface that enables the visitors to plan their sequence of activities interactively, based on their shared interests as well as factoring in the predicted wait times at each location. These kiosks have the capability to not just work passively by reacting to users, but can also proactively assist the visitors, e.g. pre-emptively take action or make recommendations even before the users have acted. The kiosks may also optionally feature virtual characters that interact with the visitors. In addition, the kiosks will be equipped with some of the latest intelligent sensing technology to automatically recognize profiles and moods of the visitors.

You and other designers have been invited to take part in a design competition where you will submit your proposed design for the user interface for a kiosk. The winning design will be implemented!

Kiosk Specifications

The project manager in charge of rolling out the kiosks has released the expected specifications for the kiosk.

1. The kiosk will take the form of a large high-resolution colour flat-screen display of 1.4m by 1m, tilted at a 45° angle.
2. The display screen has multi-touch capabilities and can even recognize the fingers belonging to different visitors.
3. The kiosk has good quality speakers for presenting speech, music and other sounds.
4. The kiosk has intelligent cameras that can recognize different visitors (e.g. if they had visited another kiosk earlier), estimate their profiles in terms of age, gender and height (some rides have minimum height limits), and even recognize their emotional states on the valence-arousal scale (see this link to the [Valence-Arousal Circumplex](#), roughly spanned in the extreme by emotional states of delighted, relaxed, bored and afraid).
5. The kiosk is networked, and can communicate with other kiosks as well as a central database server.

Key Features

The project manager has also released the set of required features for which the participating designers have to create designs and interaction mechanisms.

1. A method of presenting all the destinations within the theme park including all rides, live shows and eateries to the visitors. Information of the destinations are available from a database server and includes description of the destinations with images or video, scheduled times for the live shows, as well as distances and time it will take to walk from one destination to another. In addition, the database will also have dynamically updated current and predicted wait times (at different hours of the day) for rides and queues at eateries.
2. An interactive method for selecting and presenting an unordered subset of destinations to allow for debate among a group of visitors, such as a family who may want to stick together throughout the day or a family who prefers to split into groups with overlapping or non-overlapping interests. It should allow multiple users to simultaneously interact with the display, so that they can choose different destinations concurrently.
3. An interactive method that supports the ordering of the destinations to form a complete trip through the park. It should dynamically predict the expected time that the visitors will be at each destination.
4. It is expected that the visitors may revisit the kiosks a number of times in the middle of the trip, e.g. after one or more rides. The system should remember their past interactions and recall their previous plans, and dynamically update their schedules based on delays and the visitors deciding to change their plans. It can be assumed that there are intelligent mechanisms located around the park to determine if a visitor had actually been to a particular destination. The system may even make use of the emotion recognizer to proactively recommend changes in the remaining parts of the trip through the park.

Task

In your prototype, you have to come up with design concepts for the user interface in the scenario above, implementing the stated features within the scope of the given specifications.

*Beyond these key features, your main focus for your design should **not** be on providing extra features, but rather on exploring different ways to enhance the quality of the user experience through nice interface visuals and intuitive user interaction. You should not assume you are limited in any way to software and platform constraints or other unnecessary conventions (e.g. ask yourself: do buttons really have to be rectangular? Do they really have to be arranged in a grid? Think out of the box!)*

How to Proceed

Here is what you should do in Example Classes 1-2:

- Do your preliminary preparation by reading the documents and watching the videos stated in the later section on *Preparatory Material*.
- Creatively think of the user interface most suitable for the features described earlier. You should take into account the following points:
 - The interface needs to enable the features as described above.
 - However, the description above is very general, and the examples given are neither complete nor mandatory. So that leaves a lot of freedom and scope for designing the user interface.

- Interface design: what is the look-and-feel of the interface going to be? Does the interface follow the important principles of good interface design?
- Experience design: what kind of experience will the user get out of interacting with the application? Are some forms of interaction more appealing and natural?
- *Ignore* all aspects of implementation feasibility for the time being: platform capabilities, programming language, compute power, memory, etc. Although these are eventually important practical issues, this exercise is to focus on thinking from the user's perspective – how to design for the best usability and user experience.
- Do *not* add excessive functionality features. Not only is feature bloat bad for usability, you are also *not* graded on number of features, but quality of the design.
- Hand sketch out one or more **low fidelity prototypes** of your design. Do not overly constraint your mind and your hand, just let different ideas come to you.
 - If you have multiple prototypes, you will (for practical reasons) have to select just one of the prototypes to submit for grading.
 - **Do not create a high fidelity prototype.** Not yet. For differences between lo-fi and hi-fi prototypes, please see the *Resources and Guidelines* section below.

Please note that this is **individual-based** work. Every student needs to finish the design and deliverables on his/her own. Discussions with other students or other people outside the class are allowed and in fact encouraged. However, make sure that the design appearing in your deliverables are **unique and completely developed by yourself alone**. **You should know that NTU very seriously emphasizes academic integrity.**

Deliverables

Every student must hand in **an individual submission**, with the following content:

- **Sketches of your lo-fi prototype design.** You can use **up to 4 A4 pages** to illustrate your design using a few sketches. Note here a “page” means one side of a piece of paper.
 - Please scan your sketches or at least take a *clear, high quality, high resolution* photo.
 - The sketches **must** be created by hand sketching, whether on a physical medium (preferred), or by stylus on a tablet.

NOTE for those repeating this course: Unlike past semesters, the separate write-up has been eliminated, and the number of pages for sketching increased to 4. You are expected to make your design obvious based on your sketches alone, which can include substantial annotation.

Submission Instructions

Every student must submit their deliverables **one week after the Example Class 2 session** (the recess week does **not** count).

- Due to COVID-19 safety consideration, the assignment submission, previously requiring both physical and digital submissions, has been changed to **only digital submissions**.
- However, it is still a requirement that you **hand-sketch** your prototype, preferably on paper. However, because the TA grader now has to only rely on your digital submission, make sure

that you *scan or photograph your design carefully at high resolution*, otherwise the grader may reduce your marks if the details are not legible.

- Upload the softcopies to NTUlearn by **11.59pm**. Links for uploading your softcopy assignments will appear in the Assignments section (see left menu bar) the next day after your example class session.
 - **IMPORTANT:** this is a hard deadline. *Delays due to personal problems or technical faults (e.g. computer or network problems) is not a valid excuse for late submission.* The only exception is if there is an NTU-wide network failure or NTUlearn downtime that started *before 11pm of the deadline*. So please submit early, **well before the deadline**.
 - If you are **late** in turning in the deliverables, a coursework mark penalty may be imposed. This penalty will vary with the severity of the lateness.

Assessment

This section provides some information on how the instructors will assess your submission.

Please note that the drawings handed-in **must** be created by hand sketching (whether on a physical medium, or by stylus on a tablet), otherwise a penalty will be imposed.

The assessment of the deliverables (i.e. your sketches) will be based on the following four components which are weighted equally:

- **Relevance of Design.** Does your design implement the specified features? You have the freedom to decide the form and manner of providing these features in your interface, so long as the intended functions of those features are kept.
- **Originality of Design.** Your design will be compared to the designs of other students in your cohort. The more unique your design is in terms of form, interaction and overall look-and-feel, the higher you will score for this component. Students with near-identical designs will likewise score near-zero for this component.
- **Quality of Design.** Does your design reasonably adhere to, or clearly violate, basic UI design principles, such as Schneiderman's Golden Rules? If you want to break a particular principle because you believe there is an exceptional reason, please consult your lab supervisor first to seek clearance, then clearly justify it in your submission.
- **Clarity of Submitted Material.** Based on your submitted sketches, is it reasonably easy for a reader to understand how the user will be interacting with your designed interface? Is there sufficient annotation to make the interface and interaction clear? Are important transitions diagrammed? Are there particularly outstanding illustrations of interaction and usage that deserve extra marks? Does the report clearly explain your design?

For lo-fi prototypes, don't worry about aesthetic details, such as fonts or color or background imagery. You will notice that aesthetics is **not** part of the assessment criteria. The assessment is based more on your interface following established design principles with interesting originality, good usability and providing an enjoyable interaction experience for users. Nevertheless, it is also important to have clarity in your sketches, otherwise the instructors won't understand your design. Overall, you can expect that the effort you put into your design and your sketches will be rewarded, and that greater effort will be recognized more clearly in these assessment components.

You should be aware from the course that lo-fi prototyping is a critical part of the design process because this is where very important choices of interaction and interface are explored before key decisions are made. This is in many ways more important than hi-fi prototyping. Hence please be

aware that in the overall coursework assessment the lo-fi prototyping deliverables are given **greater weightage** than the hi-fi prototyping deliverables. So please allocate your effort and time accordingly!

Some future outlook: In Example Class 3, you will be critiquing someone else's work, and likewise you will receive a peer critique on your design. In Example Classes 4 and 5, you will design your hi-fi prototype. Your hi-fi prototype will need to be clearly developed from your lo-fi prototype, plus any critique comments that you think are appropriate. *You will not be able to create a hi-fi prototype that is not clearly linked to your lo-fi prototype design without losing substantial coursework marks.* So this is another point to note for taking your lo-fi prototype design seriously.

Resources and Guidelines

Here are some material, guidelines and suggestions that you may find helpful in your design work.

Preparatory Material

The concept of prototyping will be covered in our lecture, but perhaps not before you complete your lo-fi prototype. Hence it is strongly recommended that you do the following:

- Do your own reading up of the related materials in **module 3 of CZ2004** prior to embarking on the prototype design. This module has been uploaded to NTUlearn, and the related materials are in pages 12 to 23.
 - Please note that you do not need to be clear about all the concepts in these pages – they will be covered in detail in the lectures. You just need to understand: a) what is a prototype, which is obvious just by looking at the example prototypes provided in these pages; b) the difference between low-fidelity (lo-fi) and high-fidelity (hi-fi) prototypes so that you will **not** design a high-fidelity prototype at this stage. The difference between lo-fi and hi-fi prototypes is also quite easy to conceptualize from the examples (and descriptions) in the related materials.
 - The estimated time for reading this material is only about 10 minutes.
- Read the **Quick Primer on Sketching for Lo-Fi User Interface Prototypes** document on NTUlearn. This provides examples of lo-fi prototype sketches, and also suggests different things that you can sketch.
- Read and watch the **e-Learning material** provided on NTUlearn. These are very easy-to-digest material intended for laypersons. These include some inspiring videos that motivate and explain what interaction design and in particular lo-fi prototyping is all about.

What to present in your lo-fi prototype?

Please pay attention to the following aspects of your lo-fi prototype:

- **Key features.** Make sure that your prototype clearly illustrates the key features.
- **Annotations.** If certain features or functionality are not obvious from the drawings alone, please provide brief annotations to help viewers understand your design.
- **Temporal aspects.** When temporal considerations are involved in the desired features (e.g., a user action that can only be taken after another action), make sure that you capture in the sketch any temporal aspects of the interaction. That is, the sketch does not have to be like a “screenshot” of the user interface but rather it should depict the essence or spirit of the user interaction as much as possible.

- **Modes.** The student can also sketch different modes of the interface if it changes depending on the current state of the application. Say if you are designing a GPS navigator, the different modes may include a search mode and a navigation mode.

Refer to the **Quick Primer on Sketching for Lo-Fi User Interface Prototypes document** for further information.

How to prepare your lo-fi prototypes?

The most conventional way is to use pencil and paper, and draw your design on the paper. If you intend on doing some work during the example class sessions, please remember to bring in your own paper and pen or pencil, as these will not be provided by the lab.

An alternative is to draw electronically, say by sketching on a tablet with a stylus (do not use your finger as your fingertip is not fine enough!), and then print the design on paper. Please note it is mandatory that you draw by direct hand sketching without using special software tools, unless you have any medically-certified reasons that prevent you from doing so (in which case, please contact us as soon as possible).

It is also ultra-important to remember that we require lo-fi prototypes, **not hi-fi** prototypes. Generally, if it's obvious that your submission is hand drawn, it'll be accepted as lo-fi, but nonetheless try and minimize adding a lot of details.

Summary

Here is a summary of what you need to put in the individual report.

- Submit your lo-fi sketches as a **softcopy to NTUlearn by 11.59pm on your deadline date.**
- State your name and your CZ2004 lab group.
- Major content
 - **up to 4 A4 pages** of your **lo-fi** prototype sketches.
 - **Do not design a hi-fi prototype.**
 - The design must be prepared **solely by you.**
- Recommendation: self-study related materials beforehand.