

What is Possible?

Important Note

Remember that you are only required to do 3 out of 4 of the individual assignments. You receive your grade on the best 3 of them. If you are satisfied with your grades on the first 3 individual assignments, you are not expected to do this assignment.

Assignment Description

The objectives of this assignment are for you to explore possible future human-computer interfaces, become familiar with current research literature on human-computer interfaces, and to be creative.

In a write-up, you are to describe an interface that *is possible to create*, but *is not currently in existence*.

Science fiction often describes such interfaces. For example, when the original Star Trek was produced, a mobile, hand-held device that enables people to talk with each other was beyond the existing technology. On the show it was called a communicator. Today we call it a cell phone.

Science fiction also includes many interfaces that are not possible with current or soon-to-be-expected technologies. For example, the communicators from Star Trek are able to connect the user to a person without that person being specified. This would require some technologies that enables the communicator figure out whom they are talking to without any input from the user. This might be accomplished by some mind-reading technology or an ability to see the future and avoid all possible futures that have the wrong connection. Neither of these technologies is likely to exist in the near future.

Write-up Format

Write your assignment as an outline following the order of the outline below. Label each section of your assignment with the corresponding number and letter in the assignment. For example, when you describe the background about the task, it should be labeled “3a”.

1. Describe the intended user

- a. Characteristics
- b. Relevant knowledge
- c. Reasons the user would be motivated to use the interface/system you are describing

2. Describe the environment in which the intended user is expected to use the interface

- a. Physical

b. Social / Cultural

Describe the task the user is trying to perform using this new interface.

c. Background about the task

The background description does not need to be long, but it should give enough information that a person who is not familiar with the task can understand your subsequent descriptions.

For example, if your interface is to help musicians avoid repetitive stress injuries you should define the term “repetitive stress injury” and give some information about how important avoiding repetitive stress injuries is to musicians.

3. User’s task

a. Describe the input and output devices used by the interface.

If the I/O devices already exist or are similar to something that exists, give a specific example of the device.

If the I/O device does not exist, give a brief description of how it could/will be built. This probably will be a description of some modification or augmentation of an existing device.

4. Describe any unusual or sophisticated processing that will be needed to support the interface you are proposing.

If some algorithm or system already exists that does the processing you are describing, name it.

If the algorithm or system does not exist, give a brief description of how the system could/will be built. This probably will be a description of some modification or augmentation of an existing algorithm or system.

5. Write a scenario of how the device would be used.

Be specific in the scenario. Give some specific information about the hypothetical user, including his or her name and specific characteristics. Describe the steps the user would take to perform the task you described. Be very specific on the steps. You may need to further describe the task to make the scenario specific and understandable.

6. Find at least two (2) peer-reviewed articles from Human-Computer Interaction literature that have been published in the last 5 years and that relate to your new interface.

The articles should be chosen to support the more speculative aspects of your new interface. For example, if the interface uses an input device that does not currently exist, but is an extension of some existing device, an article about some research being performed on this device would be a good choice. If the task you are supporting is not often performed today

but will be commonly performed in the future, an article describing why this task will be common in the future would be a good choice.

Some example HCI conferences from which you can find articles include

- CHI (website for 2005: <http://www.chi2005.org/>)
- UIST (<http://www.acm.org/uist/>)
- Ubicomp (<http://ubicomp.org>)
- Pervasive (website for 2005: <http://www.pervasive.ifi.lmu.de/>)

Index of other HCI conferences: <http://degraaff.org/hci/conference.html>

7. Write summaries of the 2 or more articles chosen in step 6, and describe how they relate to your new interface.

This section can be short: a few sentences per line item below should be sufficient.

a. The summary should contain the following:

- i. A full bibliographic reference on the article.
- ii. The thesis of the article

A well-written article should have some clearly expressed idea that is the focus of the article. This idea is the thesis of the article.

iii. A description of how the article demonstrates that the thesis is true

In your description of how the article demonstrates its thesis, you should name the approach(es) used and give a brief description of them. Approach types include the following:

- Construction:
Proves a thesis by building a system that meets the requirements of the thesis
- A study
Proves a thesis by observing facts that support the thesis. The two main kinds of studies used are *case* and *statistical*. Case studies are observations one (or a small number) of scenarios. Statistical studies look at a population (normally of significant size) and tabulate quantifiable facts about the population.
- Mathematical proof
Demonstrates the thesis by formal or informal proof techniques.
- Simulation
Demonstrate the thesis by modeling the area of interest in the thesis and using simulation results to predict the thesis.
- Literature survey
Demonstrates the thesis by finding other people's work described in articles, books, *etc.* and taking excerpts or summaries of this work to make an argument that the thesis is true.

Normally an article will primarily use one approach to demonstrate its thesis, but some articles use a combination of approaches.

- iv. Your opinion of whether or not the article has demonstrated its thesis and why you hold that opinion.

Not everything written down is true. The peer-review process attempts to eliminate inaccurate and irrelevant articles, but it is not always successful. When reading an article, you should form your own opinions, which will sometimes disagree with the thesis or doubt the demonstration of the thesis.

You should be able to defend why you hold this opinion. Below are two examples: one agreeing with the thesis and one disagreeing with the demonstration of a thesis of an article.

- I believe the thesis is well demonstrated by the article. The questions in the survey (study) directly address the point of the thesis, the population studied was a representative cross section of the users of the system, and the numeric results overwhelmingly supported the thesis.
- I believe the article does not demonstrate the thesis. The system that the author constructed only addresses a special case of the problem described in the thesis and cannot be generalized to the full problem domain.

- b. Describe the aspects of the article that relate to your new interface.

Something about the article should relate to your new interface. It could relate in many ways, for example:

- Your new interface could use the hardware, software, or interaction techniques described in the article.
- The article could describe the important of the task your interface is intended to support.
- The article could be about the special needs of your intended user population.

The connection you draw should be a major aspect of the article.