

Cardiff School of Computer Science and Informatics

Coursework Assessment Pro-forma

Module Code: CM2101

Module Title: Human Computer Interaction

Lecturer: Dr Daniel J. Finnegan

Assessment Title: Human Centred Experiment Design

Assessment Number: 2

Date Set: 17/Mar/2023

Submission Date and Time: by 28/Apr/2023 at 9:30am

Feedback return date: 23/Jun/2023

If you have been granted an extension for Extenuating Circumstances, then the submission deadline and return date will be 2 weeks later than that stated above.

If you have been granted a deferral for Extenuating Circumstances, then you will be assessed in the summer resit period (assuming all other constraints are met).

This assignment is worth **20%** of the total marks available for this module. If coursework is submitted late (and where there are no extenuating circumstances):

- 1 If the assessment is submitted no later than 24 hours after the deadline, the mark for the assessment will be capped at the minimum pass mark;
- 2 If the assessment is submitted more than 24 hours after the deadline, a mark of 0 will be given for the assessment.

Extensions to the coursework submission date can **only** be requested using the [Extenuating Circumstances procedure](#). Only students with **approved** extenuating circumstances may use the extenuating circumstances submission deadline. Any coursework submitted after the initial submission deadline without *approved* extenuating circumstances will be treated as late.

More information on the extenuating circumstances procedure can be found on the Intranet: <https://intranet.cardiff.ac.uk/students/study/exams-and-assessment/extenuating-circumstances>

By submitting this assignment you are accepting the terms of the following declaration:

I hereby declare that my submission (or my contribution to it in the case of group submissions) is all my own work, that it has not previously been submitted for assessment and that I have not knowingly allowed it to be copied by another student. I understand that deceiving or attempting to deceive examiners by passing off the work of another writer, as one's own is plagiarism. I also understand that plagiarising another's work or knowingly allowing another student to plagiarise from my work is against the University regulations and that doing so will result in loss of marks and possible disciplinary proceedings¹.

¹ <https://intranet.cardiff.ac.uk/students/study/exams-and-assessment/academic-integrity/cheating-and-academic-misconduct>

Assignment

This coursework is divided into three parts. *Part I may be completed **as a team or individually**. Parts II and III **must be** completed **individually**.* Part I requires you to design an experiment recording three measures relating to a task of your choice for two systems, hereafter known as 'The Task'. Part II involves analysis of dummy experiment results. Part III involves reporting and reflecting on your experience.

Part 0: Prerequisite

You **MUST** complete the Cardiff University Research Integrity Online Training Programme **and submit your certificate with your report**. You can do this by following this link to the ethics webpage: <https://www.cs.cf.ac.uk/ethics/>. You may have completed this programme already: if so, you should provide your certificate you received upon completion. ***NB: Do NOT complete the application form the last stage in the flow chart on the ethics webpage and do NOT submit to the SREC.***

Part I: Experiment Design

In Part I your task is to ***specify how you would*** evaluate the usability of two working computer systems of your choice in a ***human centred experiment***. You should choose two systems: the first is the 'Candidate System' and the second is the 'Comparison System'. You should try to pick these systems randomly where possible i.e., do not try to determine which system is the 'best' before designing your experiment. This is important: the systems you choose must be ***real*** systems (e.g., DuckDuckGo search engine, Learning Central). If you can't decide, then you should ***compare MS Word with LibreOffice Word***. Your hypothesis for this experiment is in the following quote. You must fill the blanks as appropriate.

"It is quicker to [do/complete 'The Task'] and people rank [Candidate System] higher than [Comparison System] using the SUS because [reason based on observation]."

As part of the coursework, dummy data has been generated simulating several participants completing your experiment, split into two groups: participants in group A performed 'The Task' using the 'Candidate System' while participants in group B performed 'The Task' using the 'Comparison System'. The following measures were simulated in the experiment:

- *Time to complete (TTC)*: the total time taken to complete 'The Task'.
- *Number of errors made (ERR)*: the number of errors made by participants during 'The Task', for example clicking on the wrong UI element or repeating steps in 'The Task'.
- *SUS*: a 10-item questionnaire (details below) rating the usability of the system taken after completing 'The Task'.

It is your responsibility to design the experiment individually or as a team ***considering these measures in your design***. You are encouraged to meet in groups in the first instance to

share ideas for an experiment design, however the report you submit in Part III **MUST** be your own work. **NB: You must *NOT* conduct your experiment with any participants and/or collect data in any way. Doing so without prior ethical approval will result in a breach of the university's ethics policy for human research:** <https://intranet.cardiff.ac.uk/staff/supporting-your-work/research-support/research-integrity-and-governance/research-ethics>.

Part II: Analysing Dummy Results

Dummy data provided contains raw data for the three measures specified above. SUS is the usability score for the experiment based on the System Usability Scale (SUS). SUS scores do not tell us much by themselves. When interpreting SUS, we may rank the usability of a system compared to other systems developed in the past. To do so, Figure 1 shows historical data for 6 previous systems, with each datum calculated from the median of a set of individual SUS scores for several participants in a simulated experiment. Compute the median score for your dummy SUS data and compute the **percentile rank (PR)** for your systems using the data in Figure 1. What does this mean for each system? **NB: if you use any spreadsheet software (e.g., MS Excel, Google Sheets), you may *NOT* use built in functionality/macros/APIs to compute the PR. You *MUST* compute it yourself and include it as an equation in your report. Likewise, for any other software or methods (e.g., python script) you choose to compute the percentile rank with. Questions about how to compute the PR will *not* be addressed: computing it correctly is being asked of you in this coursework.**

Figure 1: Historical SUS data

SUS Score
60
80
70
30
90
85

Identify the simulated participants' SUS scores in each group whose SUS scores are at or above the **75th percentile** with respect to your dataset. Ask yourself: "how do these simulated participants' SUS scores relate to their raw TTC and ERR scores?"

Part III: The Report

Write an individual report containing detail of your experiment design. When writing your report, you **MUST** address the following questions as stated in the template document. The marking scheme is as included in parentheses. There are a total of **10 marks** for this coursework.

1. Write the hypothesis with the blanks filled (**2 marks**).
2. Compute the SUS score percentile rank for your 'Candidate System' and 'Comparison System' (**1 mark**) and include the equation with terms explained (**1 mark**).

3. Give a clear (e.g., step-by-step) description of your experiment **procedure (3 marks)** and comment on your design **(3 marks)**. This should include 'The Task' you've chosen in Part I. You must **justify** all decisions in your procedure. There is a maximum of **400 words** for this question. **This is important: if your submission exceeds this word count you may receive a mark of 0 for this coursework.**

You should use the criteria for assessment (Figure 2) as a set of guidelines for your writing.

Learning Outcomes Assessed

- Recognize the importance of identifying and involving users in the design and evaluation of interactive systems.
- Practical skills for evaluating interactive software systems

Criteria for assessment

Credit will be awarded against the following criteria.

Figure 2: Assessment Criteria

Fail	3 rd (40%-49%)	2.2 (50%-59%)	2.1 (60%-69%)	1 st (70%+)
<p>No attempt made at computing SUS percentile rank</p> <p>Report is incomplete, incoherent, and lacking minimum requirements</p>	<p>SUS percentile rank score is computed incorrectly</p> <p>The report contains <u>some detail</u>, but not enough to reproduce the experiment or it is unclear</p>	<p>SUS percentile rank score computed correctly</p> <p>The report contains <u>enough detail</u> to reproduce the experiment procedure yet is lacking in depth and/or decisions are <u>not justified satisfactorily</u></p>	<p>SUS percentile rank score computed correctly</p> <p>The report is of a <u>medium</u> quality, containing <u>enough detail</u> to reproduce the experiment procedure <u>approximately, justified satisfactorily</u></p>	<p>SUS percentile rank score computed correctly</p> <p>The report is of a <u>high</u> quality, containing <u>impressive detail</u> to reproduce the experiment procedure <u>exactly</u>, with decisions <u>masterfully justified</u> e.g., including <u>discussion of the limitations</u> of the experiment procedure</p>

Feedback and suggestion for future learning

Feedback on your coursework will address the above criteria. Feedback and marks will be returned by the date stated on the front page of this document via email. Feedback from this assignment will be useful for CM3203: Individual Project.

Submission Instructions

You must submit an individual report via Learning Central. The report is subject to a strict word limit specified below in Part II. You **MUST** use the template **(.md)** document provided to write your report. Do **NOT** change the filename or file extension **(.md)** of this file. **This is important: any deviation from this may result in a mark of 0 for your coursework.** Appendices are **not** allowed. Any other compressed file format (e.g., .rar, 7z) is **not** allowed. You must also submit a copy of the school cover sheet as stated above, and a completed ethics certificate as specified in Part 0. When submitting, bundle your report text document with your completed ethics certificate. Please follow the naming conventions shown in Figure 3 when submitting your files. Delete the brackets [] around your student number. **This is important: any deviation from this may result in a mark of 0 for your coursework.**

Figure 3: Key deliverables for coursework

Description		Type	Name
Individual report + Cardiff University Research Integrity Online Training Programme Certificate	Compulsory	One zip (.zip) file	[student-number]-report.zip

Staff reserve the right to invite students to a meeting to discuss coursework submissions

Support for assessment

Questions about the assessment can be asked on <https://stackoverflow.com/c/comsc/> and tagged with 'cm2101', or at the beginning of the lectures in Weeks 6 and 8. Support for the assessment will be available in the lab classes in Weeks 6 and 8.