CS 522: HW 1 **Maximum points: 100**

Topics covered:

- Shneiderman et al., 2017. Designing the User Interface: Strategies for Effective Human-Computer Interaction. Chapters 4 and 5.
- Proctor & Zandt, 2008. Human Factors in Simple and Complex Systems. Chapters 3, 4, and 9.

General instructions:

- You must submit your **own** work and not results of a group discussion.
- Soliciting homework solutions from previous terms' students will result in an **automatic F** on the assignment.
- This is an **individual** assignment, not a group assignment. Your answers should not significantly resemble your classmates' work. Use proper quotations, citations, and references, where applicable.
- Please stick to the word limits, where given. Any number of figures are allowed.
- Please write a coherent, concise, and convincing answer. If I cannot understand your logic, I cannot award you points.
- If referring to a class reading in your answer, provide the page number(s) in your citation.
- Submit your answers in Blackboard in a single word/txt/pdf file and name it Lastname_CS_522_HW_1.

Grading Rubric: Appropriateness: 70% | Clarity: 15% | Insightfulness: 10% | Accurate references: 5%

Question 1: 25 points

The State of Maryland is developing a web-voting interface. For selecting the candidates, one design (RB) is a set of radio buttons and another is (CB) a combo-box (drops down when selecting the scroll arrow icon), both using standard fonts at 10-point size.

(a) Compare these two designs when there are 4 candidates and predict the relative speed of performance and error rates. Support your choice by a thoughtful argument.

(b) Would you propose a new design for elderly and motor-impaired users who have difficulty controlling a mouse? If not, why? If yes, how?

Question 2: 25 points

One argument against the current interface design of a popular word processor is that it has all the functional menu items appearing together which cause the interface to be too complex. This complexity results in a confusing and frustrating experience for novice users. An alternative design is to provide different levels of functional complexity, so users can choose the level that is suitable for them, then advance to a higher level as they get familiar with the tool, thus feel more comfortable and learn more efficiently. You are asked to conduct usability testing to compare these two designs.

(a) Which type of usability testing should be used for this situation? Explain why.
(b) List some general principles of subject selection in usability testing. How should you select subjects for this case?

Question 3: 15 points

Explain system reliability using the analogy of "a chain is only as strong as its weakest link" (100 words max.)

Question 4: 10 points

Imagine you are designing a Force Touch UI. Force Touch is a feature that was developed by Apple to sense the level of force exerted on a touchpad or trackpad and respond accordingly. People exert forces differently, based on gender, age, and physique. How would you develop a general scale to measure force touch input that could then be reliably used to trigger system responses as well as be discernible to human users? (300 words max.)

Question 5: 25 points

You are asked to evaluate the HTC Vive (https://www.vive.com/us/). Your employer is planning to use it for developing apps for rehabilitation of veterans suffering from PTSD and K-10 science learning. What human factor measures will you capture during a user study? How would you recommend using those measures to inform the design of the proposed applications? (300 words max.)