#### **Computer Science and Information Management**

**School of Engineering and Technology**

# **AT71.9004 Human Computer Interaction and Information Visualization**

**January 2022 Semester**

**FINAL EXAM**

## **Instructor: CHAKLAM SILPASUWANCHAI**

## **Time: 2 hours**

**STUDENT NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ STUDENT ID. NO. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* This exam accounts for **30%** of the overall course assessment**.**
* This exam is **open-booked; open-internet.**
* The completed exams shall be submitted at the Google Classroom

**EXAMINATION RULES:**

* For **offline students**, you may leave the room temporarily with the approval and supervision of the proctors. No extra time will be added to the exam in such cases.
* For **online students**, you are required to turn on your webcam during the entire period of the exam time
* Students will be allowed to leave at the **earliest 45 minutes** after the exam has started
* **All work should belong to you. A student should NOT engage in the following activities which proctors reserve the right to interpret any of such act as academic dishonesty without questioning:**
  + Chatting with any human beings physically or via online methods
  + Plagiarism of any sort, i.e., copying from internet sources or friends. **Even one phrase or sentence will be punished severely.**
* No make-up exams are allowed. Special considerations may be given upon a valid reason on unpredictable events such as accidents or serious sickness.

1. Analyze the data given in the attachment. The data is about task correction measured between task1 and task2, handheld gaming device, and handyness (1 hr.). Answer the following questions:

1. Is this a within/between/mixed design?
2. What are the independent and dependent variables? How many levels?
3. Report the descriptive statistics (i.e., mean and std) of each independent variable.
4. Is the data normal?
5. How about homogeneity of variance tests?
6. Based on two above questions, should we use parametric or non-parametric tests?
7. Let’s assume that we use parametric test,
   1. What is the p-value? Is it significant at the α = .05 level?
   2. What is the effect size? Is it small, moderate, or big?
   3. What is the post hoc result for device?
   4. Report the result in APA format.
8. Let’s assume that we use non-parametric test,
   1. What is the p-value? Is it significant at the α = .05 level?
   2. Report the result in APA format.
9. Design the following experiments: Imagine a **novel haptic glove** for VR system is proposed. This haptic system is claimed to improve **haptic/tactile feedback when touching objects** which the author hopes it will further improve engagement and immersion. The clear baseline is to compare with a **simple VR controller**. Now the author is stuck with designing a sound experiment to prove that his/her glove is cool, and work as expected. Please help the author identify ALL aspects of experimental design. Answer using the tabular format below. (*Feel free to make any assumptions and state your assumptions in the description; for example, we did not say whether the glove is used for gaming purposes or not*.) (1 hr.)

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| **Study 1 (if you are going to have more studies)** | | |
| No. | Experimental Aspects | Description |
| *1* | *IV* | *How many IV, how many levels, etc.* |
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