

# Usability Test Plan

## Team 6: micro:bit

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## **Test setup:**

The usability test should be conducted over zoom.

Before the test session:

1. Mail and confirm the micro:bit is delivered
2. Email the participants the zoom connection information
  - a. link
  - b. password
3. Explain, test zoom, share screen, camera and microphone

During the session:

1. Start the zoom meeting before the scheduled time
2. Greet the participant
3. Purpose the test and verbal consent
4. Start recording
5. Ask for screen sharing
6. Explain the app
7. Read test scenario, ask for “think aloud”
8. Participant perform the task
9. Repeat
10. Interview
11. Post experiment questionnaire
12. Thank the participant

## Test Scenario 1:

**Name:** Single Connection test

### Goals:

- To check if the app start up and initialize successfully
- To check if the participants are able to successfully follow the instruction to connect the micro:bit to their computer
- To check if the participants are able to navigate to the connection menu
- To check if the app can identify the paired micro:bit
- To check if the app can connect successfully with the paired micro:bit

### Scenario description:

You are a owner of a micro:bit. You have very little knowledge about the micro:bit. You just found this web app that advertises itself that it can help you to connect and test your micro:bit. You then decided to open the app and figure it out.

### Task list:

- Open the app
- Read the instruction and follow to connect the micro:bit
- Click the connect button
- Select your paired micro:bit

- Click connect
- Check the connection status to see if you are connected

**Quantitative measurements:**

- Time for the app to load
- Time from start reading the instruction to connect the micro:bit
- The number of times the participant ask for help

**Qualitative measurements:**

- Any question during the test
- Errors occurred during the operations

**Potential observations of participant:**

- Responding time for each operation
- Confusion and think aloud comments

**Post Scenario interview and questionnaire questions**

1. Do you have any trouble connecting the micro:bit?
2. Is the interface and instruction clear and helpful?

**Test set up details and questionnaire: see in appendix**

## **Test Scenario 2:**

**Name:** Data collection test

### **Goals:**

- To check if the participants are able to successfully follow the instruction to start/pause/stop data collection
- To check if the app can successfully graph data collected
- To check if the participants are able to interact with the graphed data and focus on the data they are interested in

### **Scenario description:**

You are a owner of a micro:bit and you wanted to see the data you collected more intuitively. After connecting the micro:bit, you decided to start data collection. You are interested in the min and max of all the data collected and record them.

### **Task list:**

- Start the data collection
- Pause for several seconds then continue
- Navigate and interact with the plotted data
- Zoom and click on one(any) data point, report the value and the time
- Repeat previous step

- Stop the data collection
- Zoom and click on the maximum data collected, report the value and time
- Zoom and click on the minimum data collected, report the value and time

**Quantitative measurements:**

- Time used in navigating the graph
- The number of times the participant ask for help

**Qualitative measurements:**

- Any question during the test
- Errors occurred during the operations
- Correctness in finding or reporting the numbers

**Potential observations of participant:**

- Responding time for each operation
- Confusion and think aloud comments

**Post Scenario interview and questionnaire questions**

1. Does the plotted data make sense to you?
2. Do you have any trouble focusing on any data point you wanted?
3. Is the interface and instruction clear and helpful?

**Test set up details and questionnaire: see in appendix**

## Test Scenario 3:

**Name:** Multiple Connection test

### **Goals:**

- To check if the participants are able to successfully follow the instruction to connect multiple micro:bits to their computer
- To check if the app can identify each paired micro:bit
- To check if the app can connect successfully with multiple paired micro:bits
- To check if the app can successfully graph data collected with multiple micro:bits
- To see if the participants are able to navigate between different micro:bit's data graph

### **Scenario description:**

You are a owner of several micro:bits. You already know this web app can help you with one micro:bit. You decided to connect a second micro:bit.

### **Task list:**

- Read the instruction and follow to connect the second micro:bit
- Click the connect button
- Select your second paired micro:bit

- Click connect
- Check the connection status to see if you are connected with the second micro:bit

**Quantitative measurements:**

- Time from start reading the instruction to connect the micro:bit
- The number of times the participant ask for help

**Qualitative measurements:**

- Any question during the test
- Errors occurred during the operations

**Potential observations of participant:**

- Responding time for each operation
- Confusion and think aloud comments

**Post Scenario interview and questionnaire questions**

1. Can you tell which one is the second micro:bit?
2. Is the interface and instruction clear and helpful?

**Test set up details and questionnaire: see in appendix**



## Test Scenario 4:

**Name:** Export csv file

**Goals:**

- To check if the app can successfully export the data collected

**Scenario description:**

You are a user that cares about the data you collected and want to save the data to a file. After some period of collection, you decided to output the data you collected to a csv file for later examination.

**Task list:**

- Stop the data collection if not already stopped
- Export the file and choose where to store it
- Navigate to the csv file and open it

**Quantitative measurements:**

- Time used to store the data

**Qualitative measurements:**

- Any question during the test
- Errors occurred during the operations
- Problem with the stored data in csv file

**Potential observations of participant:**

- Responding time for each operation
- Confusion and think aloud comments

**Post Scenario interview and questionnaire questions**

1. Do you find any problem with saving the data?
2. Can you find your saved data easily?

**Test set up details and questionnaire: see in appendix**





## **Appendix: Post experiment questionnaire**

Put your answers in the brackets. Please let me know if you have any confusion with any of the questions.

**1. What system are you using? ( )**

- a. Windows
- b. Linux
- c. macOS
- d. others (put name in the brackets)

**2. What version is your system? ( )**

**3. If you are using linux, which distribution are you having? ( )**

**4. Are you a Chrome user? ( )**

- a. I only/mainly/often use Chrome browser
- b. I rarely use Chrome browser
- c. This is the first time that I use Chrome browser

**Please indicate your level of agreement to the follow statement:**

**5. Overall, this application was easy to perform the task. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**6. Overall, the user interface is clear and intuitive. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**7. Overall I found this application visually appealing. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**8. Overall the app responding time for each interaction is fast and satisfying. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**9. The connection is easy and I can easily figure out whether the device is**

**connected or not. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**10. The control over start/pause/stop the data collection is straightforward.**

**( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**11. The plotted data graph clearly shows the data collected and easy to understand. ( )**

- a. Strongly agree
- b. Agree
- c. Neutral
- d. Disagree
- e. Strongly disagree

**12. The plotted data graph is easy to interact with and I can navigate to anywhere I want on the graph. ( )**

- a. Strongly agree
- b. Agree

- c. Neutral
- d. Disagree
- e. Strongly disagree

**Please answer the following question**

**13. What is the best part of the app? Why is it good?**

**14. What is the worst part of the app? Why is it bad?**

**15. Any advice or comments on improving the interface/logic/interaction?**



## **Computer User Interface Usability Testing**

You are being invited to participate in a research study to determine the usefulness and usability of computer user interfaces. This study is being conducted by Dr. Robert Pastel of Michigan Technological University Computer Science Department and Dr. Pastel's Human-Computer Interaction (HCI) courses. The students are performing the usability tests as part of their project and to fulfill the HCI course requirements.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you and the tasks that you will perform will determine the usefulness and usability of user interfaces. The questionnaires and the tasks should take less than an hour to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

The questionnaires and tests are anonymous. No one will be able to identify you and your answers, and no one will know whether or not you participated in the study except for the instructor of the class who is giving you credit for participating. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing the questionnaires and performing the tasks, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer or not to perform a task for any reason.

The testing may make use of video conferencing software which will record your tasks on computers screen and from your webcam. The webcam

recordings will not be shared, and you may mute the webcam at any time. Before sharing your screen, you should clear your desktop of any open apps except your browser. Also you should clear your desktop of any icons or widget that you wish not to be observed.

If you have any questions about the study, please contact Dr. Robert Pastel, AssociateProfessor, Computer Science Department, Michigan Technology University, Houghton, MI49931.

The MTU Institutional Review Board has reviewed the request to conduct this project. If you have any concerns about your rights in this study, please contact Joanne Polzien of MTU-IRB at 906-487-2902 or email [jpolzien@mtu.edu](mailto:jpolzien@mtu.edu)