

MIMBCD-UI

User Testing Guide

Francisco Maria Calisto
francisco.calisto@tecnico.ulisboa.pt

09/04/2018

Prototype: [prototype-breast-cancer](#)
Milestone: [1.0.6-alpha](#)

Version: [v1.0.6-alpha](#)
Release: [v1.0.6-alpha](#)

DICOM: [dicom-server](#)
Commit: [d889ba07d715a3f47bc01634f2163af30b147a20](#)

Deployment Environment: Test
Link: [breastscreening.isr.tecnico.ulisboa.pt](#)

Deployment Server: Test

Main Server: [Test](#)
Private IP: [10.0.1.23](#)
Private Domain: [cromo.isrnet](#)

Port: 8081
Public IP: [193.136.138.62](#)

DICOM Server: [Test](#)
Private IP: [10.0.1.23](#)
Private Domain: [cromo.isrnet](#)

Port: 8043
Public IP: [193.136.138.62](#)
From: 8143

1 Introduction

This document aims to describe the protocol performing a set of tests in the scope of [v1.0.6-alpha](#) version from the [prototype-breast-cancer](#) repository of the [Medical Imaging Multimodality of Breast Cancer Diagnosis User Interface \(MIMBCD-UI\)](#) project using a traditional devices (mouse and keyboard). The goal of the test is to understand the user, performance, efficiency and efficacy metrics. With the session, the sessions will be recorded via video on the computer and using a record, heat-map and triggered event tools. It is guaranteed the confidentiality of the recordings, which will be used only for academic purposes.

Dividing each test session into three parts. In one test the traditional device is supported by the interaction with mouse and keyboard. The second part, we will do a small questionnaire about the experience and feel. Finally, the third part we will have a final survey about preferences of users.

2 Material

For the material and apparatus, it is essential to capture the session apprehending the user interactions. In our case, we will record this interaction by using the [QuickTime Player Version 10.4 \(928.5.1\)](#) to obtain all interactions. We will pair this video tool with a user watch tool called [Hotjar](#). This tool serves the purpose of using several logs of the interaction and gives us visualisation over it. Both instruments will help us to capture where are users interacting. By looking at the test participant's reactions, we find a lot of information regarding the prototype design.

The tools that we choose for the material and apparatus of this User Testing Guida are low-cost and easy to use. Our equipment is a cost-effective and, by using our laboratory materials, bringing it to the radiology room, we enable to capture not only what the user is doing on the screen, but on the body language supported by the interviews and observation.

The material used in the test sessions for the user interface consists of:

- MacBook Pro: it will allow the user to interact with the keyboard and a wireless mouse;
- Wireless Mouse: it will allow the user to interact with a mouse and will complement the keyboard;

2.1 Technical Details

To produce this traditional environment, and since we can simulate with a laptop, the mouse and keyboard interaction, we are using a Microsoft Mobile Mouse 4000 together with the MacBook Pro (Retina, 13-inch, Early 2015) with a standard integrated keyboard on the laptop.

3 Description

blabalaba

3.1 Traditional Devices

Traditional interaction remains the most common way to interact with user interfaces in a clinical environment. Unfortunately, most of this interaction is made by low profile equipment that makes users produce more errors and take more time interacting with those user interfaces.

TODO...

As we can see in Figure 1, it describes our User Interface (UI), where the patient ("Anonymized1" for example) breast are on a small left column. The options are in a short row near of the viewport and described below. We also have the tabs where the user can change the patient. The centre viewport shows the DICOM Image, and it can be configured to display a number up to four DICOM images. The viewport has some text information on it (yellow) with the details of the metadata.

Manual annotation is adopted by us thanks to the CornerstoneJS Freehand ROI and Probe annotation features. According to the Cornerstone Library, the user can create an annotation by setting up consecutive landmarks around a Region of Interest (ROI). The markers finish a lesion annotation when it interconnects the historical. Additional features available in our User Interface (UI) includes on-demand increment of the number of landmarks, and throw transformations of the shape of an annotation.

3.2 Interactive Buttons

The systems have several buttons (Figure 2) that allows the user to interact or access to a set of user interface features. The buttons are (from left to right):

- WW/WC
- Invert
- Zoom
- Pan
- Stack Scroll

- Length Measurement
- Window Controller
- Freehand

3.3 Usability Evaluation Technique

Number	Issues of Content Key Questions
1	How do you perceive this activity?
2	Could it be done in a more intuitive way?
3	What are the consequences?
4	Why did you do as you did with this activity?
5	Is this activity relevant for you?
6	Could you suggest another way to do this activity?

Table 1: My caption

4 System

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

4.1 Environments

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Figure 1: Image Sample



Nisi ut aliquid ex ea commodi consequatur? Vel illum qui dolorem eum fugiat quo voluptas nulla pariatur?

4.2 Interaction

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Figure 2: Banner Sample



List of something with no enumeration:

- Something 1
- Something 2
- Something 3
- Something 4
- Something 5
- Something 6
- Something 7
- Something 8
- Something 9

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur.

5 Procedures

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

5.1 Initial Questionnaire

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

- Sex, Age, Literacy.
- Experience with ...
- Experience with ...
- Experience with ...

5.2 Introduction

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

5.3 Training Session

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

5.4 Execution of Tasks

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

5.5 Final Survey

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

6 Tasks

During our usability tests, we need to ask participants to provide a subjective assessment of their experience using our system. There are several widely used questionnaires giving us different pros-and-cons. However, in most cases, a [single question instrument](#) [1] is the right method for a quantitative usability testing. By taking less time and effort to answer, participants are pursuing to this phase after task while it is minimally disruptive.

In our **User Testing Guide** a set of tasks is necessary and carefully crafted. Our usability studies involve asking participants to perform the following tasks. By looking at what our user need to do with our system, our tasks are realistic as possible. We are not describing the exact steps participants need to take. We achieve that by avoiding the precise language used as labels in our system. The tasks are emotionally neutrals. And we did several [pilot tests](#) to prevent misleading situations saving us from wasting resources by accidentally use a lousy task or from getting bad data. The tasks are as follows.

List of stand alone tasks:

Task 1: Annotate the **US** modality from the **20160229** date;

Task 2: Annotate the last medical image of the **Breast** study description;

Task 3: Annotate the second **MR** frame number **10** of the last patient;

7 Measurements

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

- Measurement 1;
- Measurement 2;
- Measurement 3;
- Measurement 4;
- Measurement 5;
- Measurement 6;
- Measurement 7;
- Measurement 8;
- Measurement 9;

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

- Difficulty of ...
- Difficulty of ...
- Difficulty of ...
- Degree of ...

References

- [1] J Sauro. 10 things to know about the single ease question (seq). *Measuring U*, 2012, 2012.