IEEE Software Requirements Specification Template

Software Requirements Specification

for

Project Caesar

Version 1.1

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Revision History

Name	Date	Reason For Changes	Version
Jordan Alvarez	11/06/2018	Updating information from Milestone 6	1.1

1. Introduction

1.1 Purpose

This SRS is for the Project Caesar software suite. Project Caesar is a research initiative to analyze and evaluate the cognitive abilities of Non-Human Primates at the Brevard Zoo.

1.2 Document Conventions

Yellow highlighting on any text in this SRS indicates that the information needs to be gathered from the project client.

Blue highlighting on any text in this SRS indicates that the information needs to be elaborated on by the development team once more information becomes available.

1.3 Intended Audience and Reading Suggestions

Intended audience of this document will be project clients and sponsors as well as project managers.

1.4 Product Scope

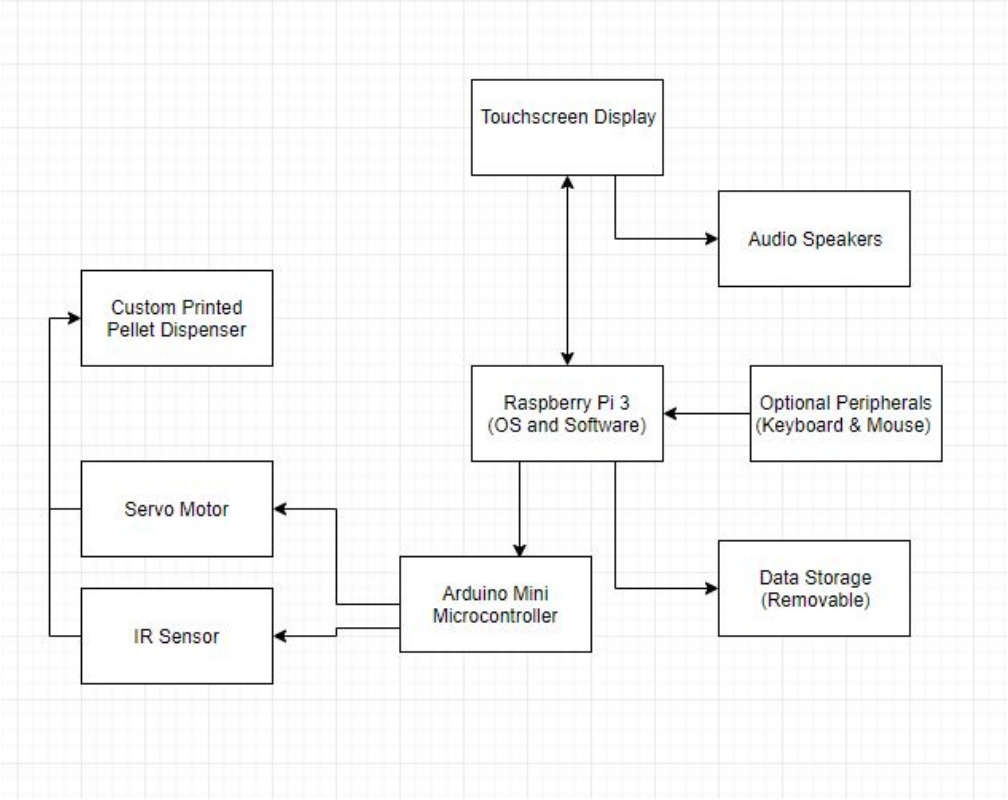
The Project Caesar software suite will be a software and hardware system that will consist of many pieces which ultimately serve as tests and examinations for the Non-Human primates to interact with. The software will be run of a custom built hardware system.

1.5 References

2. Overall Description

2.1 Product Perspective

This product is being constructed to replace the current hardware and software suite used by client. This software suite will be written from scratch and an all new hardware system will be built tailored to the clients needs. A basic diagram of the system is included below:



2.2 Product Functions

- *GUI*
  - *Main Menu (Configuration Screen)*
  - *Test Start Screen*
  - *Interactive Testing Screen*
  - *Data Presentation Screen*
- *Data collection*
  - *Correct/incorrect attempts*
  - *Timestamp for each attempt*
  - *Timestamp for length of the test*
  - *Location of image at each attempt*

2.3 User Classes and Characteristics

This product will be target towards those in the psychological research industry, with an emphasis on Non-Human Primate research. The main user base will be targeted primarily at researchers.

2.4 Operating Environment

- *Hardware*
  - *Touchscreen Display*
  - *Raspberry Pi 3 B+*
  - *Audio Speakers*
  - *Arduino Microcontroller*
  - *Custom Pellet dispenser*
  - *Peripherals (Mice and Keyboards)*
- *Software*
  - *OS: Raspian*
  - *GUI interface: TornadoFX*
  - *Software Language: Kotlin, Arduino C*

2.5 Design and Implementation Constraints

- *Policies*
  - *Basic safety considerations will be made to ensure the safety of users and test subjects*
- *Technologies*
  - *Raspberry Pi 3*
  - *Arduino Microcontroller*
  - *Raspian OS*
  - *Kotlin*
  - *TornadoFX framework*
- *Language Requirements*
  - *Intellij Idea IDE*

2.6 User Documentation

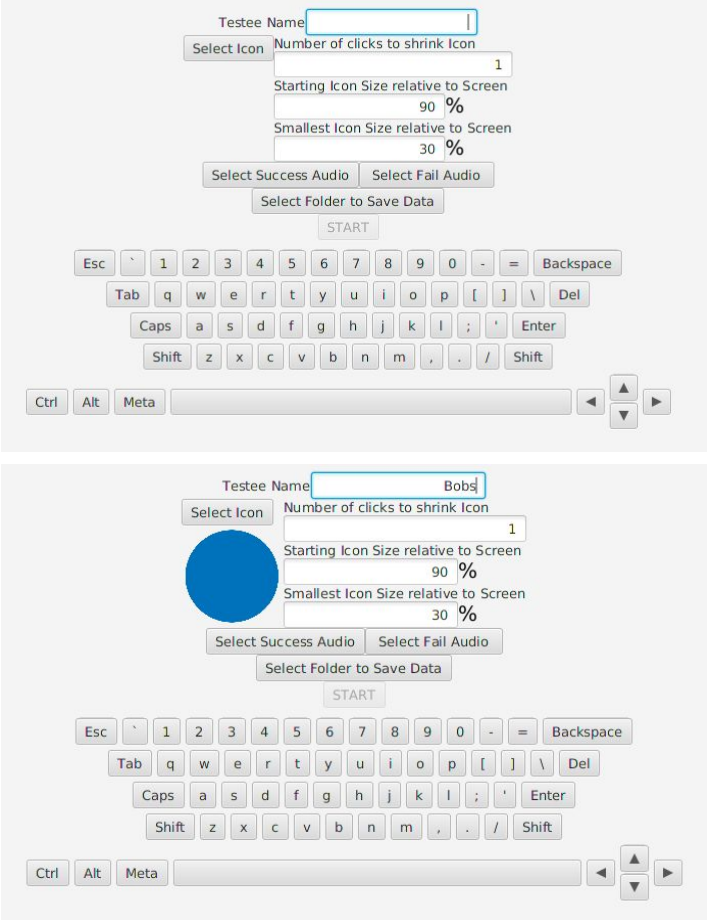
- *Project Caesar will be a custom hardware and software system so there is no pre-existing documentation. Documentation shall be developed by the team as part of the project.*

3. External Interface Requirements

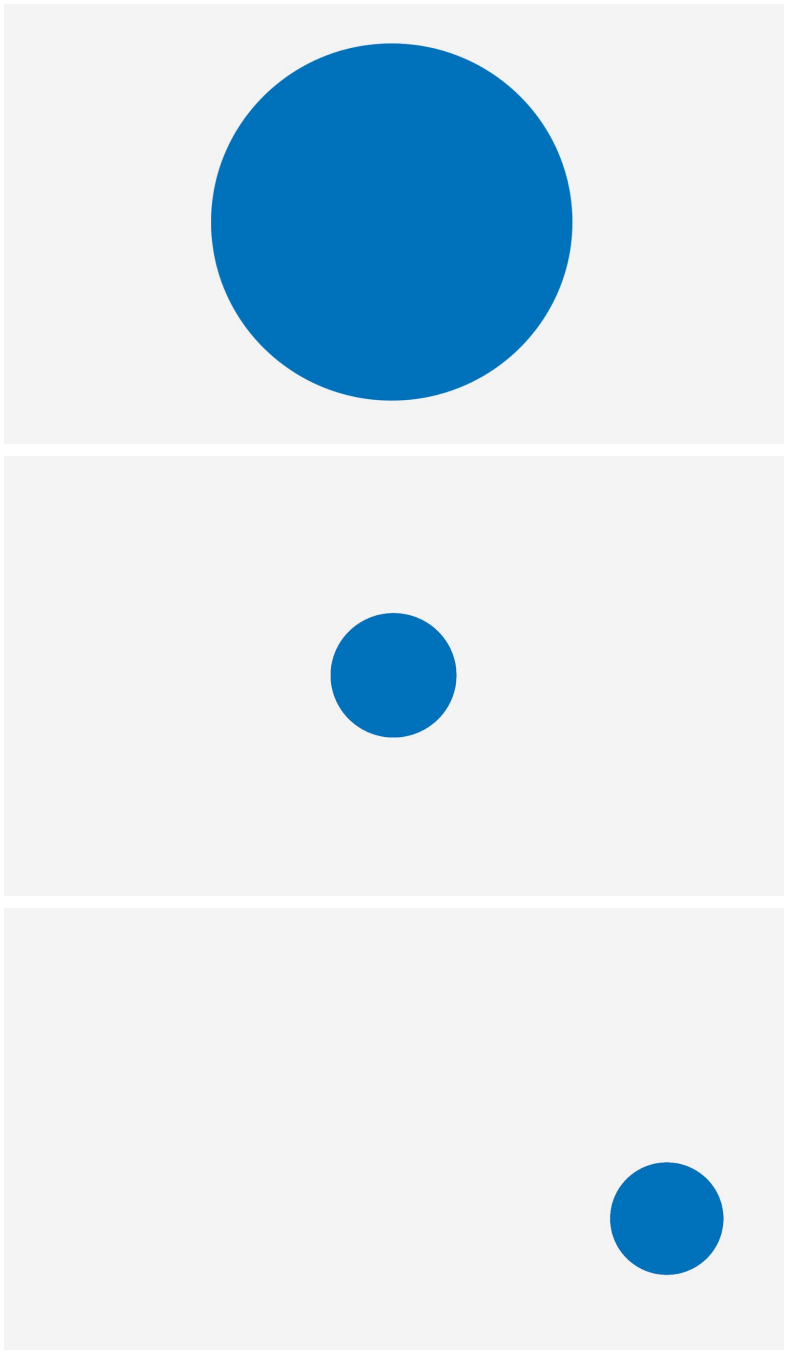
3.1 User Interfaces

The software shall be comprised of two screens, the main menu and the testing screen. The main menu shall be used by the human user and will contain all the necessary settings and configurations for the test and subject. The testing screen shall show an object on the screen that the non-human primate subject shall interact with until the testing is complete. Example images of these screens are included below.

Configuration Screen:



Testing Screen:



3.2 Hardware Interfaces

The control software suite will be communicating with all hardware using the Raspberry Pi and Arduino Microcontroller.

3.3 Software Interfaces

The software suite will be packaged in a linux executable and run on the Raspbian operating system. The Kotlin language and TornadoFX framework shall be used to construct the software.

Outgoing data will contain the following:

- *An integer value sent to the arduino microcontroller to activate the servos and dispense a treat*
- *All data collected from the test will be ported into a .csv file for later analysis*

Incoming data being accepted by the control suite will include the following:

- *Input from the main menu settings, input from the subject during the testing phase*

3.4 Communications Interfaces

The hardware system will be communicating primarily through the Raspberry Pi input and output ports

4. System Features

4.1 Main Menu Screen

4.1.1 Description and Priority

- *The main menu screen will be the main screen displayed at application launch. This screen will contain all of the configuration settings and selections for the assessments and tests included in the software.*

4.1.2 Stimulus/Response Sequences

- *The main menu will be used by the human user through either the touchscreen interface or through the use of peripherals such as a mouse or keyboard.*

4.1.3 Functional Requirements

- REQ-1: Must include on screen keyboard
- REQ-2: Must include image and audio selectors

4.2 Test Start Screen/ Testing Screen

4.2.1 Description and Priority

- *The testing screens will be launched after the human user has entered all the desired configuration settings. The testing screen will differ greatly depending on the assessment test that the human user has selected.*

4.2.2 Stimulus/Response Sequences

- *The main user of these screen will be the Non-Human Primate subjects. The subject will interact with the assessment, receiving either positive or negative feedback based on the interactions performed by the subject*

4.2.3 Functional Requirements

- REQ-1: Must show the user selected image
- REQ-2: Must use the user selected audio
- REQ-3: Must adhere to all of the user defined settings
- REQ-4: Must collect all necessary data and port it to csv

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The touchscreen display must be useable by the Non-Human Primates, many of which have differing way of interacting with the screen.

5.2 Safety Requirements

- The system must be stable and able to stand freely without fear of falling over. All power and electrical components must be well insulated to prevent shock of any kind.

5.3 Software Quality Attributes

- The software must be developed in such a way that it can be expanded upon in future iterations
- The client would like the software to be designed as an open source project in order to share the software easily with other researchers

Appendix A: Glossary

- *SRS - Software Requirements Document*
- *GUI - Graphical User Interface*
- *OS: Operating System*
- *TBD - To Be Determined*
- *N/A - Not Applicable*
- *REQ - Requirement*