

Experiment 1: Apply the knowledge of SRS and prepare Software Requirement Specification (SRS) document in IEEE format for the project

Learning Objective: Students will able to List various hardware and software requirements, Distinguish between functional and nonfunctional requirements, indicate the order of priority for various requirements, analyze the requirements for feasibility.

Tools: IEEE template and MS Word

Theory:

The srs should contain the following Table of Contents

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Software Requirements Specification

for

AirMouse2.0

Version 1.0 approved

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1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the software Air Mouse 2.0. It will explain the purpose and features of the software, the interfaces of the software, what the software will do and the constraints under which it must operate. This document is intended for users of the software and also potential developers.

1.2 Document Conventions

This Document was created based on the IEEE template for System Requirement Specification Documents.

1.3 Intended Audience and Reading Suggestions

- For advertising agencies , who want to use AirMouse 2.0 for use in interactive screens.
- For gamers, who want to use AirMouse 2.0 for playing easy and moderate games.
- For teachers , who want to use AirMouse 2.0 for using it in their presentations.
- For any other general users , who want to use AirMouse 2.0 to virtually interact with their devices with gestures and actions.
- For developers , who want to use the AirMouse 2.0 api to create their own applications.
- For programmers who are interested in working on the project by further developing it or fixing existing bugs.

1.4 Product Scope

AirMouse 2.0 is a tool and software which provides gesture and action based navigation for devices. Using AirMouse 2.0 users can use pre built gestures and actions to navigate screens and devices. Advanced users can also define their own gestures and actions. AirMouse 2.0 also comes with a set of API's for developers to use in their own projects.

1.5 References

- IEEE Template for System Requirement Specification Documents:
<https://goo.gl/nsUFwy>
- GNU General Public License version 3: <http://www.gnu.org/licenses/gpl.html>
- CDDL Common Development and Distribution License:
<https://opensource.org/licenses/CDDL-1.0>

2. Overall Description

2.1 Product Perspective

Air Mouse 2.0 is a software for all those who have a difficult time accessing and interacting with screens physically. It is a Hand Gesture-based navigation software which will help users to control their devices virtually and with this they can perform their task very smoothly and efficiently. It will also give users a great experience and will motivate them to work on machines for even longer periods of time than usual. Using AirMouse 2.0 users can use pre built gestures and actions to navigate screens and devices. Advanced users can also define their own gestures and actions. AirMouse 2.0 also comes with a set of API's for developers to use in their own projects.

2.2 Product Functions

- Define Gesture :
 - Open Camera
 - Do action or gestures
 - Save gesture
- Customize Gesture:
 - Window options (always on , sticky)
 - Shortcut definition
 - Mapping gesture to computer action
- Gesture Recognition :
 - Playing games
 - Teaching
 - Video control

2.3 User Classes and Characteristics

- Typical Users, such as advertisers can use AirMouse2.0 for gesture recognition in stores, malls and parks.
- Teachers would get an interactive edge in the classroom with the introduction of such technology.
- Advanced/Professional Users, such as engineers or researchers, who want to use AirMouse2.0 for more detailed operations where hands are not free to be used.
- Programmers who are interested in working on the project by further developing it or fix existing bugs

2.4 Operating Environment

The AirMouse2.0 software works on WindowsXP, Windows Vista, Windows7, Windows10, MacOS X and Linux operating systems.

2.5 Design and Implementation Constraints

Air Mouse 2.0 is developed in python, it uses PYQT, C-Sharp and dotNET framework for its visualization. It uses a modular design where every feature is wrapped into a separate module and the modules depend on each other through well-written APIs. There are several APIs available to make plugin development easy.

2.6 User Documentation

To be updated

2.7 Assumptions and Dependencies

AirMouse2.0 is developed in Python and therefore requires Python to be installed on the developer's and advanced user's system. The latest stable version of AirMouse2.0 requires Python version 3.8 or higher. This applies to Windows, Linux and Mac OS X users.

3. External Interface Requirements

3.1 User Interfaces

1. **HomePage.**
Landing page after installing the AirMouse application. Provides movement options to all the other UI screens and has options to start the AirMouse Control with default Options.
2. **Set Gesture Page.**
This Page has controls to recognize gesture and set it to the particular output
3. **Sensitivity Controls.**
Controls to adjust sensitivity.
4. **Overlay Controls.**
Adjust The overlay controls
5. **Set Webcam**
Webcam setting and debugging.

3.2 Hardware Interfaces

The minimum hardware requirements of Air Mouse2.0 are

- 4GB RAM
- 3.90 GHz 4 cores clock speed processors
- 5 megaPixel Webcam
- GPU support requires a CUDA®-enabled card (Ubuntu and Windows)
- 5 gb disk space

3.3 Software Interfaces

- Python 3.7–3.10
- Python 3.10 support requires TensorFlow 2.8 or later.
- Python 3.9 support requires TensorFlow 2.5 or later.
- Python 3.8 support requires TensorFlow 2.2 or later.
- pip 19.0 or later (requires manylinux2010 support)
- Ubuntu 16.04 or later (64-bit)
- macOS 10.12.6 (Sierra) or later (64-bit) (no GPU support)
- macOS requires pip 20.3 or later
- Windows 7 or later (64-bit)
- Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019

3.4 Communications Interfaces

AirMouse 2.0 requires internet connection to download and update the software. No internet is required for the functioning of the software; everything happens in real time.

4. System Features

This section demonstrates Air Mouse 2.0 most prominent features and explains how they can be used and the results they will give back to the user.

- Custom shortcuts to applications using gestures.
- Custom gesture definition.
- Real time detection.
- API (Access to high level API to develop your own application)

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The performance of the Air Mouse 2.0 depends upon the computational power of the system and the lighting effect because it may affect the detection of gestures. Performance of Air Mouse 2.0 will also depend upon the Camera's picture quality and Frame rate.

5.2 Safety Requirements

To ensure that no one of Air Mouse 2.0's users loses any data while using the product (due to a crash or a bug of some kind) the developer team updates Air Mouse 2.0 regularly. There is a bug tracker available where users can report any bugs they have encountered so that the developers can fix it in the next release.

5.3 Security Requirements

Air Mouse 2.0 does not have any security requirements and thus any type of user can use it without any additional privileges.

5.4 Software Quality Attributes

Air Mouse 2.0 provides the users with both simple and advanced features. Due to its well designed and easy to use interface it can be used by both experts and typical users. However, advanced users must already have a basic knowledge of programming before using it.

5.5 Business Rules

AirMouse 2.0 is a copyright protected open source software. Free to use for all people. We request the operators to partake in this spirit and use the software for all private and personal purposes. We follow a low interference policy.

6. Other Requirements

No Special requirements apart from the ones already mentioned.

Learning Outcomes: Students should have the ability to

- LO1: List various hardware and software requirements
- LO2: Distinguish between functional and nonfunctional requirements
- LO3: Indicate the order of priority for various requirements
- LO4: Analyze the requirements for feasibility Course

Course Outcomes: Upon completion of the course students will be able to prepare SRS document

Conclusion: After making SRS Documentation (Software Requirement Specifications), we can analyze our product's pros and cons very easily which helps us in updating our product. It's a great help because of which we understand the functional and non-functional requirements of our product.

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [40%]	Attendance / Learning Attitude [20%]	
Marks Obtained				

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