# Requirement Specification

# Introduction:

This document defines a system capable of inputting positional data to a computer from a human hand. The system is a very common computer input device, providing comfortable ergonomics for users and high bandwidth input to a computer from a human. In recent years wireless technology has become far more prevalent in these devices due to reduced latency and lower weight. This is a legally binding document which outlines the system purpose, objectives and requirements with regards to a conventional consumer.

# System Purpose:

The purpose is to create a device that allows for positional input to a computer from a hand, whilst being the bottleneck of the transfer of information from the hand to the computer as little as is possible.

# Objectives:

To serve the system purpose as best as is possible, the mouse shall meet the following objectives:

1. To provide a piece of equipment that is comfortable for use for extended periods of time in an office context.
2. To provide a long-lasting battery life which could last a full day of work without needing to be recharged.
3. To provide a product for as low a price as possible without compromising on the other objectives.
4. To provide a product that shall function as intended for as long as possible.
5. To provide a system that is as sustainable as possible.

# System Requirements:

## Functional

In order to meet these objectives as best as is possible, the mouse shall meet the following requirements:

1. The system shall have a total weight of 200g or less.

* *This requirement derives from the objective of providing a piece of equipment that is comfortable to use for extended periods of time. The user should not have to strain themselves to move the mouse after hours of use. [objective 1]*

1. The system shall have an accuracy of 1600 dots per square inch (dpi) or above.

* *This requirement derives from the objective to provide a piece of equipment that is comfortable to use for extended periods of time. Being certain that the system is not the bottleneck of transfer of information to the computer shall reduce any frustrations the user may have. [objective 1]*

1. The system shall possess a low latency of below 10ms from movement of hand to input to computer.

* *This requirement derives from the objective to provide a piece of equipment that is comfortable to use for extended periods of time. A lower input delay shall result in a more responsive, and therefore more comfortable experience. [objective 1]*

1. The system shall have a battery life of 10 hours of constant use.

* *This requirement derives from the objective to provide a long-lasting battery life which could last a full day of work without needing to be recharged. [objective 2]*
* *This requirement also derives from the objective to provide a comfortable experience whilst using the system for extended periods of time. This is due to a smaller battery, which only lasts a single day weighing less than a battery that would last a week but be heavier. [objective 1]*
* *This requirement also derives from the objective to keep the cost to produce the product as low as possible as a smaller battery is cheaper. [objective 3]*

1. The system shall have a cost to manufacture of below $20.

* *This requirement derives from the objective to keep the cost to produce the product as low as possible. [objective 3]*

1. The device shall be able to function as intended for 1,000,000 inputs on both of its binary inputs

* *This requirement is derived from the objective to provide a product that would function as intended for as long as possible. The more uses the device can sustain, the longer its functional lifetime will be. [objective 4]*

1. The battery of the system shall be able to last for 3000 cycles

* *This requirement is derived from the objective to provide a product that shall function as intended for as long as possible. The more cycles the battery of the device can sustain without losing significant capacity, the longer the lifetime of the product. [objective 4]*

## Non-Functional

1. The device shall be able to operate within a temperature range of 10 – 35 °C

* *This derives from the objective to provide a comfortable to use product in an office setting as an office will always be at a reasonable room temperature. [objective 1]*

1. The device shall be able to operate within a standard humidity range of 5% to 95%.

* *This requirement derives from the objective to provide a comfortable to use product in an office setting as an office will always be at a reasonable humidity level between 5% and 95%. [objective 1]*

1. The device shall have a length no larger than 150mm, a width no larger than 60mm and a height no larger than 60mm [3].

* *This is derived from the objective that the device will be comfortable to use in an office environment, with this size limitation the device will take up less space on a desk as well as providing superior ergonomics. [objective 1]*

1. The device shall have a rechargeable battery, as opposed to disposable batteries

* *This requirement is derived from the objective to create a device that is suitable for use in an office environment as constantly replacing batteries is inconvenient and simply recharging the device is a far simpler solution. [objective 1]*
* *This requirement is also derived from the objective of creating a device that is as sustainable as possible as batteries do not need to be disposed of over the course of the systems operating lifetime. [objective 5]*

1. The system will be designed to comply with UK and EU regulations with regards to its disposal at the end of its life. It shall comply with waste electrical and electronic equipment (WEEE-2003) regulations. This shall be complied with by making at least 65% of the materials used in the construction recyclable [2].

* *This fulfills the objective of building a system that is as sustainable as possible as the product will need to be disposed of at the end of its service life. [objective 5]*

1. Eco-design regulations in the form of complying with the Restrictions of Harmful Substances directive of 2003 (RoHS-2003). This shall be done by restricting usage of: Lead-, cadmium-, mercury-, chromium VI-, PBB- and PBDE [1].

* *This fulfills the objective of providing a suitable product for use in an office environment. [objective 1]*
* *This fulfills the objective of providing a sustainable product that will be easily disposable at the end of its life. [objective 5]*

# References

1. GOV.UK. (2019). *Regulations: restriction of hazardous substances (RoHS)*. [online] Available at: https://www.gov.uk/guidance/rohs-compliance-and-guidance [Accessed 1 Nov. 2019].
2. Designsociety.org. (2019). [online] Available at: https://www.designsociety.org/download-publication/19155/ECO-DESIGN+IN+PRACTICE+-+CASE+STUDY+WITH+COMPUTER+MOUSE [Accessed 1 Nov. 2019].
3. TheGamingSetup. (2019). *Gaming Mouse Size Interactive Chart & Table*. [online] Available at: https://thegamingsetup.com/gaming-mouse/buying-guides/mouse-size-chart-table [Accessed 1 Nov. 2019].