# 1. Functional Requirements

## 1.1. Pose Estimation

### 1.1.1. Pose Estimator Size

The pose estimation system shall fit into the human hand.

### 1.1.2. Pose Estimator Weight

The pose estimator shall weigh no more than 7 Kg

### 1.1.3. Pose Estimator Power

The pose estimator power source should be integrated into the system on the human hand.

### 1.1.4. Pose Estimator DOF Measurement

The pose estimator shall measure all the degree of freedom achieved in the human hand and wrist.

### 1.1.5. Pose Estimator Pose Data

The pose estimator shall provide data relating to the pose of the fingertips and the hand relative to the forearm.

### 1.1.6. Pose Estimator Twist Data

The pose estimator shall provide data relating to the twist at the wrist and all finger joints relative to some reference point(s).

### 1.1.7. Pose Estimator Data Reference Point

The pose estimator shall provide measured data relative to some reference point(s) that can be calibrated on the robot. The reference point shall not be more posterior to the forearm.

### 1.1.8. Pose Estimator Outbound Data Transmission

Data from the pose estimator shall be transmitted wirelessly to the robot and visualization system.

### 1.1.9 Pose Estimator Inbound Data Transmission

### 1.1.10 Pose Estimator Response Time

The pose estimator shall have a response time of not more than 80ms.

### 1.1.11 Pose Estimator Data Transfer Rate

Pose and Twist Data from the pose estimator shall be transmitted at a rate of not more than 80ms.

## 1.2. Robot Operation

### 1.1.1 Robot Outbound Data Transmission

Data from the robot shall be transmitted wirelessly to the visualization systems.

### 1.1.2 Robot Inbound Data Transmission

Incoming data from the pose estimator and visualization system to the robot shall be received wirelessly

### 1.1.3. Robot Reaction Time

The robot shall respond to changes in the target position in no more than 100ms.

### 1.1.4. Robot Accuracy

The robot shall achieve a pose accuracy of not more than 1cm.

## 1.3. Visualization, Configuration

## 1.4. Power Management

### 1.4.1 Constant Voltage

A constant operating voltage of 12 V should be maintained by the power management system.

### 1.4.2 Power Surge Protection

Power surges from inside or outside the system shall be terminated by the power management system.