# MoveCritic – Wearable Full Body Motion Tracking System (WFBMTS) Hardware Design Document

## 1. Introduction

The MoveCritic - Wearable Full Body Motion Tracking (WFBMT) Hardware is designed to provide comprehensive and precise full-body motion tracking for analysing form and posture during exercises, stretches, and movements, with a particular focus on aiding physiotherapy practices. The system comprises individual wearable motion tracking elements known as Body Tracking Elements (BTEs), strategically placed on various significant areas of the user's body to enable full-body motion tracking. These BTEs are wireless, battery-powered devices utilising MEMS (Micro-Electro-Mechanical Systems) inertial measurement units to track attitude and motion. The system's central component is the Body Tracking Controller (BTC), which facilitates communication between the BTEs and an app running on an external smart device.

## 2. System Overview

The MoveCritic WFBMT Hardware system consists of the following key components:

### 2.1 Body Tracking Elements (BTEs)

* The BTEs are individual wearable devices equipped with MEMS inertial measurement units.
* They are strategically placed on various areas of the user's body to capture detailed motion data.
* Each BTE is wireless, battery-powered, and capable of Bluetooth Low Energy (BLE) communication.
* A BTE is required for each landmark body location.

### 2.2 Body Tracking Controller (BTC)

* The BTC serves as the central hub for the system.
* It receives motion data from all BTE devices via BLE communication.
* The BTC integrates a Bluetooth link to facilitate communication with a smartphone application.
* Additionally, the BTC acts as a storage case and charging station for all BTEs when they are not in use.

The complete system is comprised of a single BTC which can host a number (max number of landmark locations) of BTE’s.

### 2.3 Landmark Body Locations for BTE’s