Human motion analysis system based on IMU sensor

It is a motion analysis system that can be used to calculate kinematic parameters, such as joint angles, limb acceleration, joint velocity and angular acceleration, and the linear acceleration of the center of mass of the limbs without the use of cameras and other cumbersome equipment.

The IMU system has 15 light and wireless sensors that are easily connected to the subject using a strap and have the ability to transmit the subject's movement information to the system. This system is portable and its use is not limited to a specific laboratory environment.

The technical characteristics of the IMU system are:

- 3-axis gyroscope
- 3-axis accelerometer
- 3-axis compass
- Thermometer
- 16 bit accuracy
- Low pass filter
- Maximum sampling rate 1 kHz
- Has input for synchronizing sensors
- Rechargeable battery (minimum continuous operation 3 hours)
- Dimensions of the sensors: 40 x 25.8 mm
- Digital filter
- Implementation of inverse dynamic equations
- Ability to output with various formats such as ASCII and C3D