Physical Activity detection and Body Posture Recognition

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Body Motion Capture

Motion Capture/Tracking:
- the process of recording or reconstructing the movement of body parts.

Applications:
- Filmmaking
- Computer Gaming
- Sport
- Virtual Reality
- Rehabilitation
- …
Motion Capture Technologies

**Mechanical motion capture systems**
- linked structures
- track the degree of rotation for each link
- no data noise
- restricted movement
- fixed configuration of sensors
- expensive

Gypsy 7™ Motion Capture System
Motion Capture Technologies

**Optical motion capture systems**
- light weight reflective markers
- high resolution cameras
- marker occlusion
- limited application environment
Motion Capture Technologies

Inertial motion capture systems
- Inertial Measurement Unit (IMU)
  - Accelerometer (±2g, ±4g, ±8g, ±16g)
  - Gyroscope (±250, ±500, ±1000)
  - Magnetometer (±4800μT)
- Small size
- High accuracy
- Cheap (~ 5 USD)
- Easy to use
- Not limited to the lab or studio
IMU-based Motion Tracking

**Accelerometer:** gravity direction
**Gyroscope:** angular velocity
**Magnetometer:** magnetic field

![Diagram](image-url)
What We Have Done @ Otago
Body Posture Capture

Our projects:
- Body posture capture
Body Posture Capture

Our projects:
- Body posture capture
Activity Recognition and Posture Detection

Our projects:
- Spinal posture monitoring and improper curve recognition

Smart shirt for spinal posture monitoring and bad posture detection