

Measurements in Biomechanics

Example of Tools

- 1) Goniometers
- 2) Foot Switches
- 3) Load Cells
- 4) Force Plates
- 5) Motion Capture

Goniometers

Used to measure angles

At a single moment:

- Angle

Over a period of time:

- Range of Motion (min/max angle)
- Angular speed and acceleration

Foot Switches

Detect contact

At a single moment:

- Determine the event which will be analyzed

Over a period of time:

- Events (heel strike, toe off)
- Frequency

Load Cells

Measure force

Over a period of time:

- Min / Max
- Start / Stop

Force Plates

Measure force and moments

Over a period of time:

- Location of the CoP (min/max, total displacement)
- Min / Max force
- Start / Stop (movement, contact)

Motion Capture

Used to identify location of segments

At a single moment:

- Angles
- CoM

Over a period of time:

- Range of Motion (min/max)
- Speed and acceleration
- Displacement

Location of segments

2D space: 3 degrees of freedom

- Up and down
- Side to side
- Horizontal rotation

Location of segments

3D space: 6 degrees of freedom

- Up and down
- Side to side
- Front and back
- Horizontal rotation
- Vertical rotation
- Roll