



Linköpings universitet

Lätt tillgängliga sensorer ger oändliga möjligheter

*Position and orientation estimation using inertial
sensors*

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April 22nd 2015

- Accelerometers
 - Gyroscopes
 - Magnetometers
- } Inertial sensors



Inertial sensors and magnetometers give information about the position and orientation of the sensor.

Use inertial sensors in combination with other sensors and different models to determine position and orientation.

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- Find good models for the sensor signals and the specific application.

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- Find good models for the sensor signals and the specific application.
- Find a good way to combine this knowledge, taking into account uncertainty in the models and measurements.

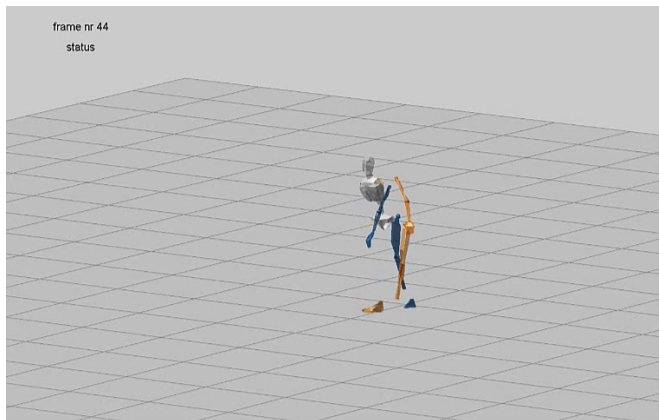
Example 1: Inertial motion capture



17 sensors placed on the body

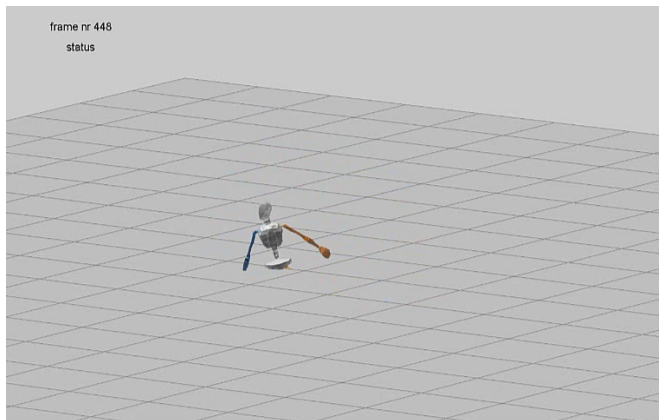
Courtesy of Xsens Technologies

Use only inertial sensors



Courtesy of Xsens Technologies

Use inertial sensors + a biomechanical model

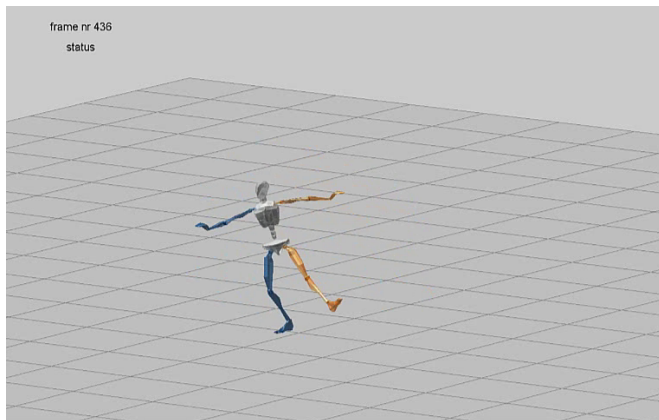


Courtesy of Xsens Technologies

Example 1: Inertial motion capture



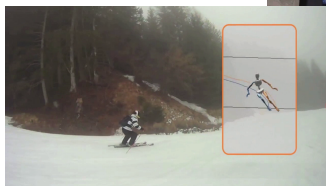
Use inertial sensors + a biomechanical model + a world model



Courtesy of Xsens Technologies

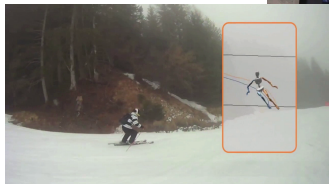
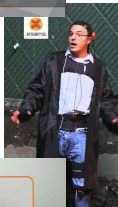
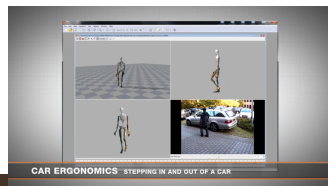
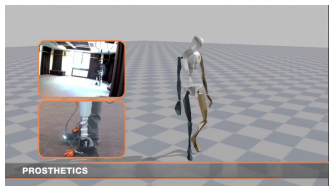


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Applications of inertial motion capture



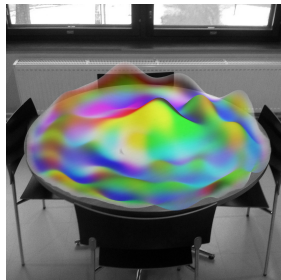
Courtesy of Xsens Technologies

For indoor positioning we can not use GPS.
Instead, we want to use information from the indoor magnetic field.

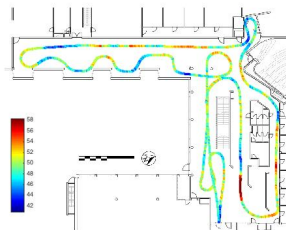
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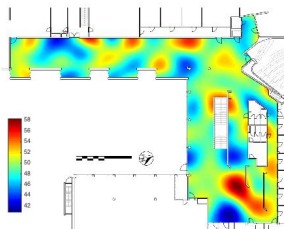
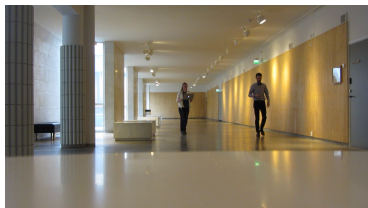
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Example 2: Indoor positioning using magnetometers



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Finding your way inside a building ...



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this is for instance important for firemen.

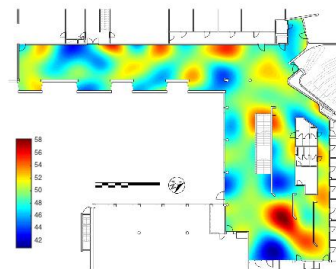
Position and orientation estimation using inertial sensors.

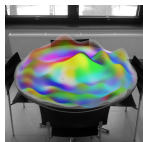
Position and orientation estimation using inertial sensors.

Example 1: Using inertial sensors together with biomechanical and world models for motion capture.



Example 2: Using magnetic field measurements for indoor positioning.





Thank you for your attention!

Questions?

