



Video based in-home fall risk assessment

Greet Baldewijns



Why is fall risk assessment important?

- to identify persons with an increased fall risk;
- to identify possible risk factors;
- to facilitate the implementation of fall prevention strategies



Accurate fall risk estimation can be an important aid in the prevention of fall incidents

When do we need to assess a person's fall risk?

- At admission time;
- A change in a patient's condition;
- Any addition or change in medication;
- High-risk patients need daily assessments;
- Immediately after a fall;



Fall risk assessment is an ongoing process

How is fall risk currently assessed?

- checklists;
- timed – Get – Up – and – Go test;
- 10 meter step test;
- berg balance scale;
- five step test;
- functional reach test;
-

What are the shortcomings of these methodologies?

- artificial setting;
- test awareness;
- administered infrequently;
- snapshot;
- time-consuming;
- ...



There is a need for an automated fall risk assessment tool that can continuously monitor the fall risk of a person on a continuous basis

Advanced Integrated Sensing

AdvISe

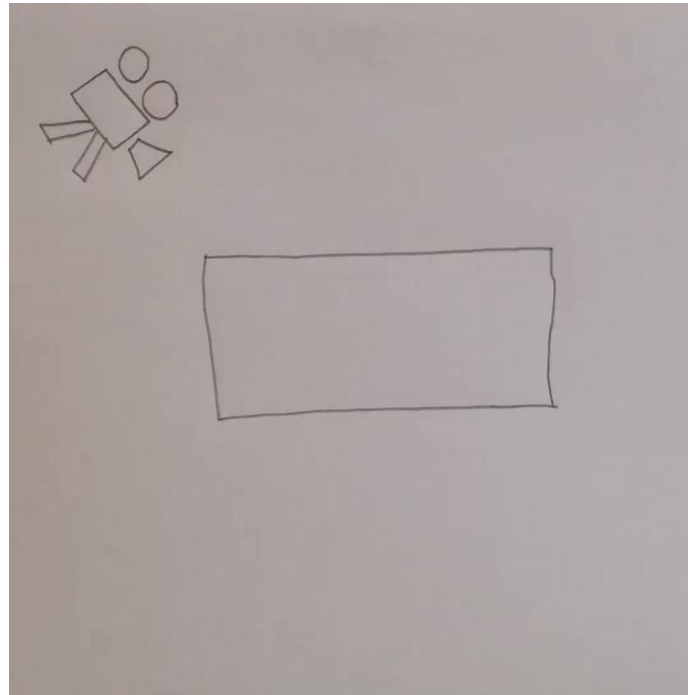
KU LEUVEN

Our approach - Concept

- Automating fall risk assessment:
 - Gait speed used as primary predictor for:
 - hospitalization
 - decline in health
 - falls
 - Measuring the time needed to perform the exact same transfer several times a day.
 - Using real-life data acquired with cameras

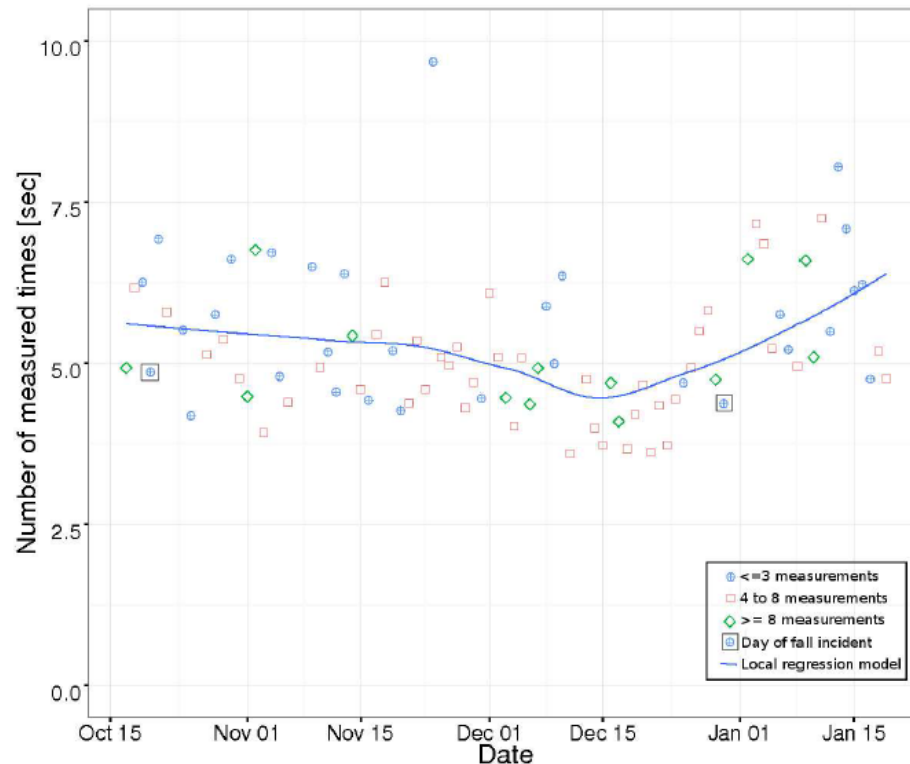
Our approach – Measuring transfer times

- Predefined walking zone
- Automatic selection and measurement of the transfers several times a day during several weeks (4 participants)



Our approach – Results of one participant

Participant	Age	Sex	Home	Walking aid	Period	Events	Project
A	75	F	Service flat	Walker, Cane, NA	12 weeks	444	AMACS



Other carers

Nurse

Family members

Who should review this data?

General Practitioner

Physiotherapist

Should they?

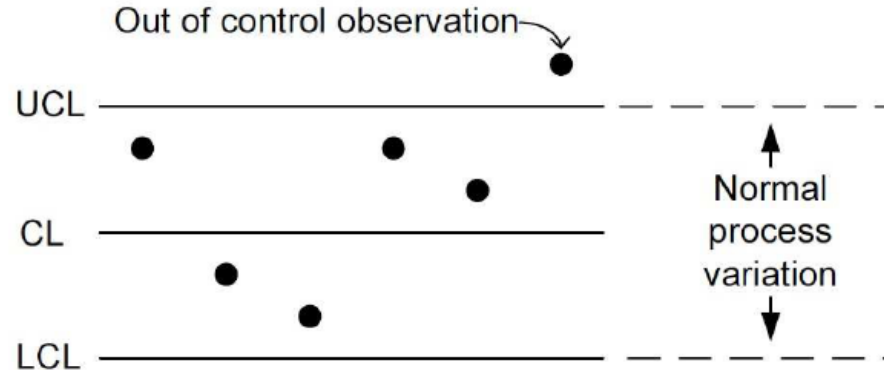
- Review data for each patient individually?
- Daily / weekly / monthly?
- When to intervene?



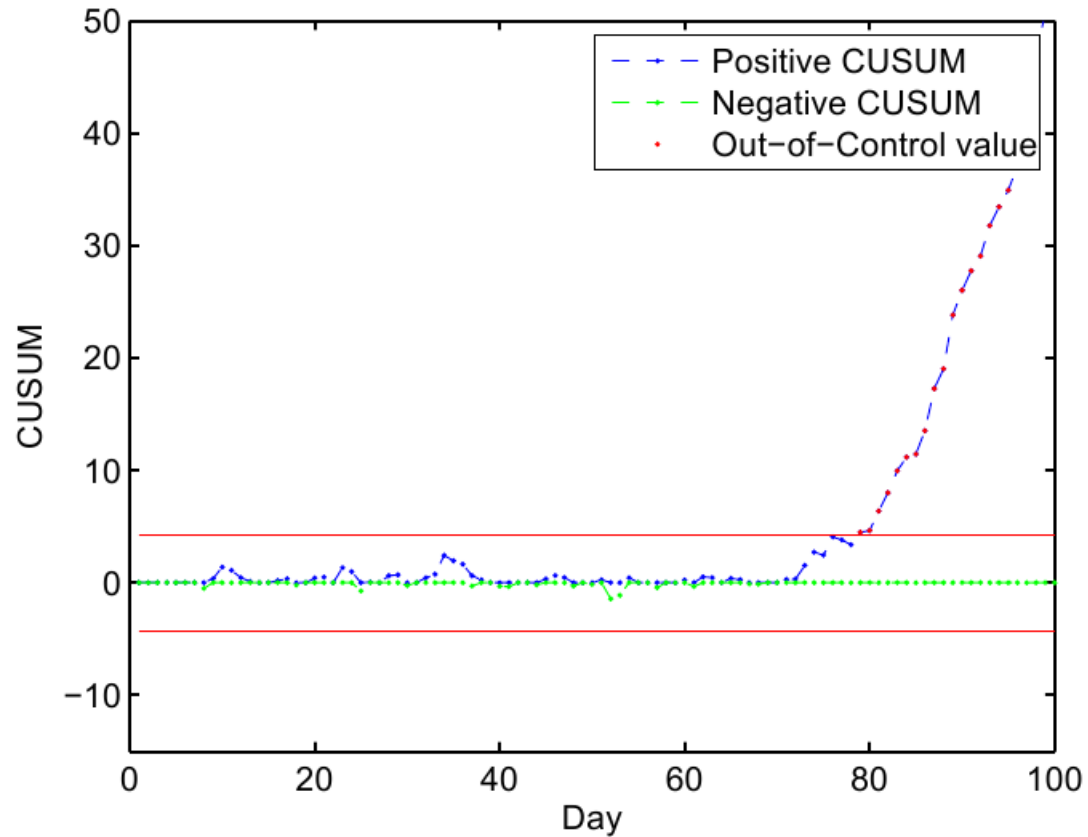
The system should automatically trigger an alert when the transfer times change significantly

Automatically triggering alerts - Concept

- Use Statistical process control (SPC) techniques:
 - Monitor a process and identify variations not inherent to the process
 - Define upper control limit, lower control limit and center line of control charts using median and std of first 2 weeks of data
 - An unusual source of variation results in a point outside the control limits which warrants investigation

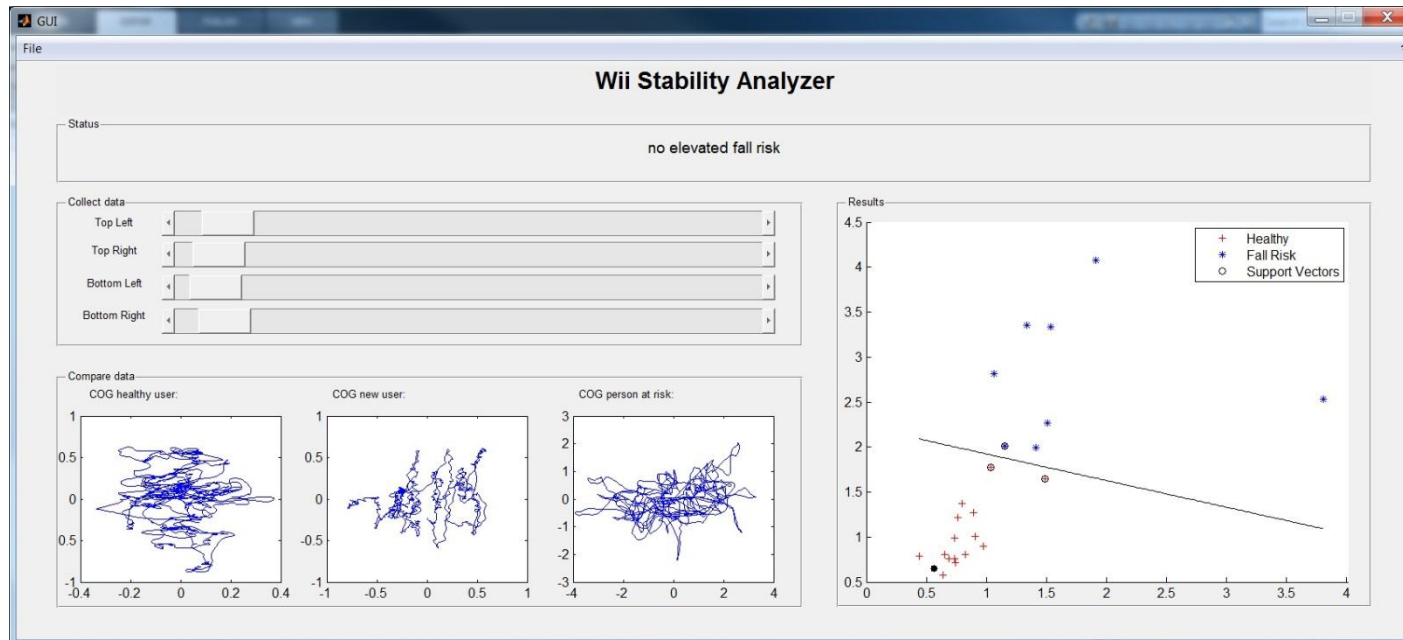


Automatically triggering alerts



Using the Wii Balance Board to classify elderly people as fallers and non fallers

- Use 4 Balance sensors to calculate COG of a person;
- Measure COG during 40 seconds
- Automatically classify a person as 'healthy' or as a person with an elevated fall risk



Questions?



Advanced Integrated Sensing

AdvISe

KU LEUVEN

