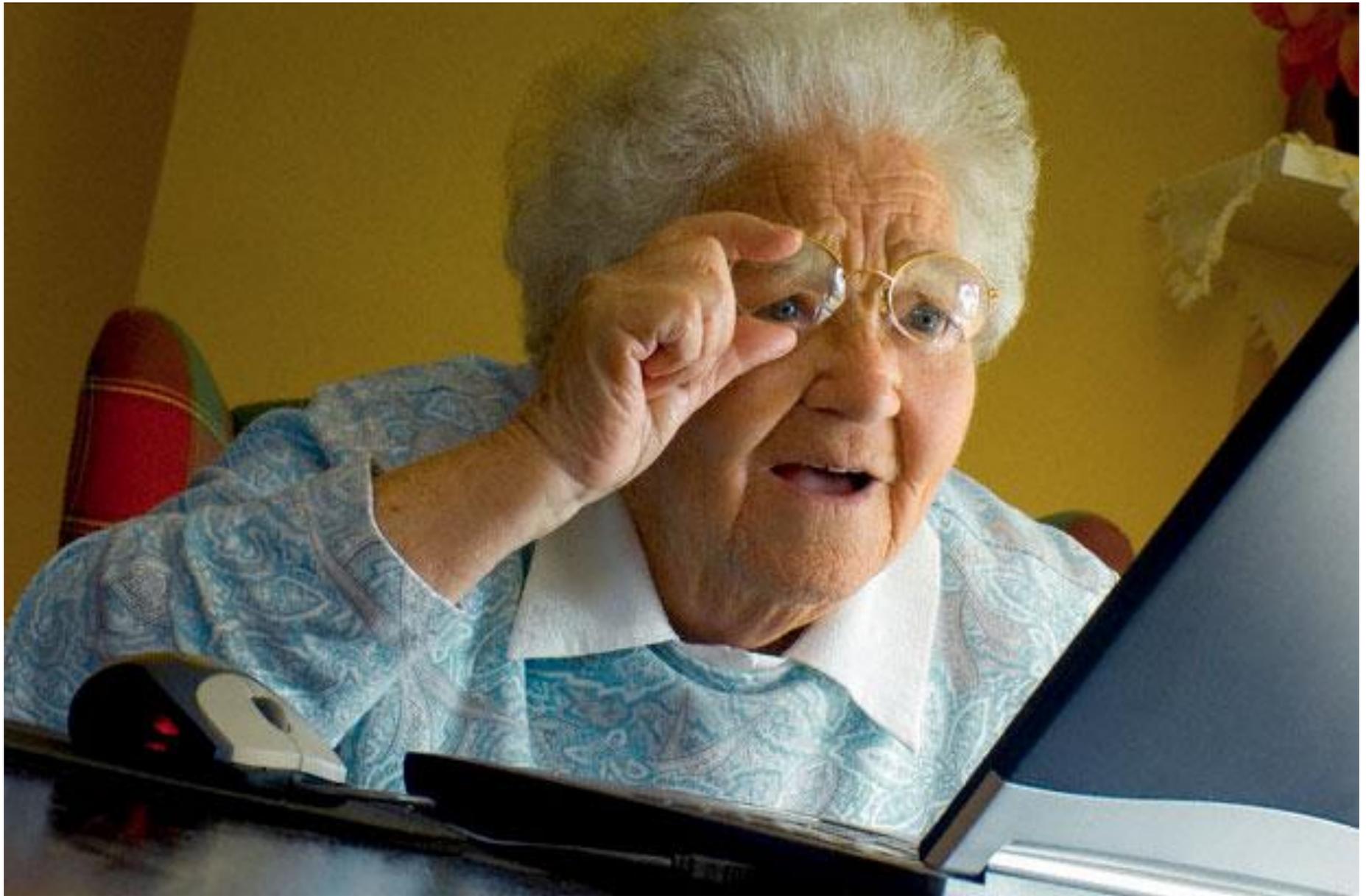


Mobile Monitoring of Joint Loading Profiles in Persons with Degenerative Hip and Knee Problems

Prof. dr. Annick Timmermans, Universiteit Hasselt

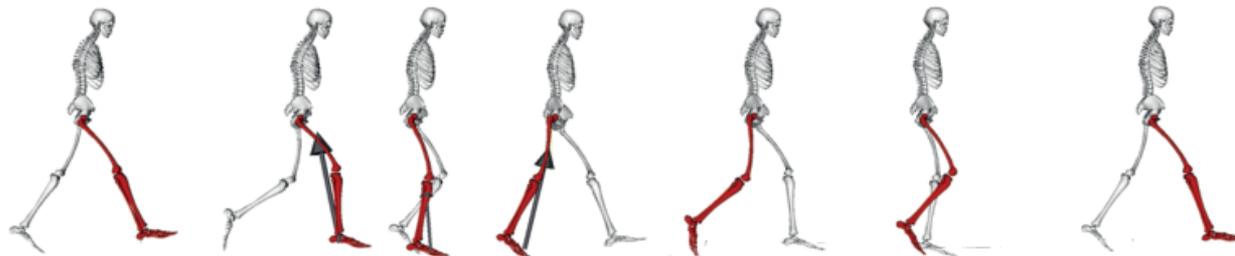
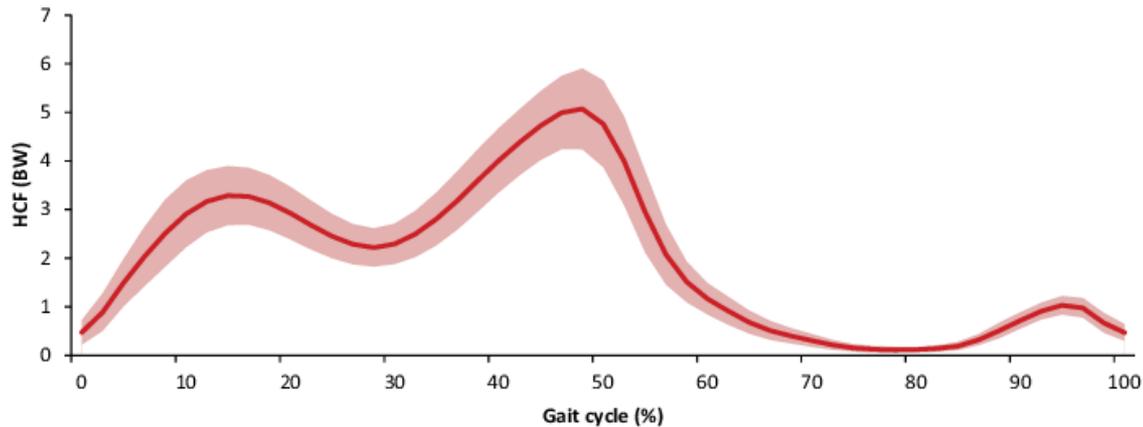


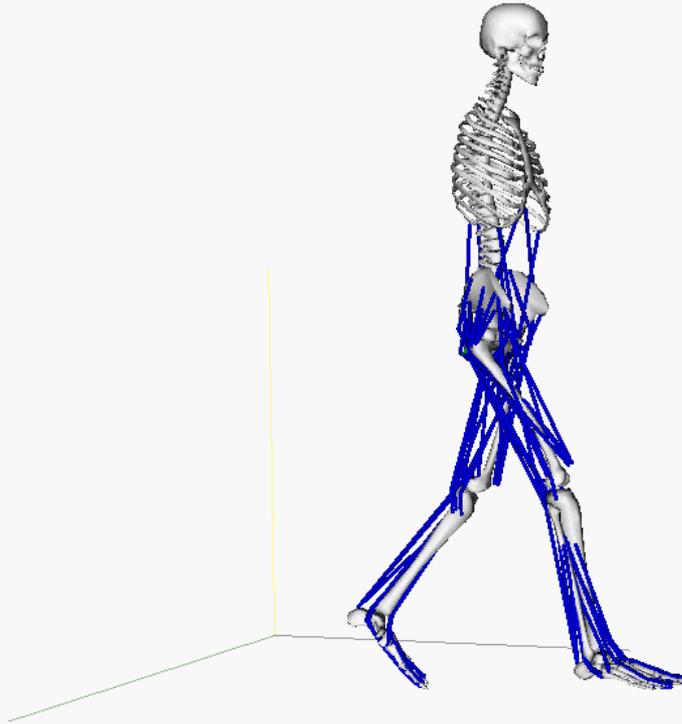
Background

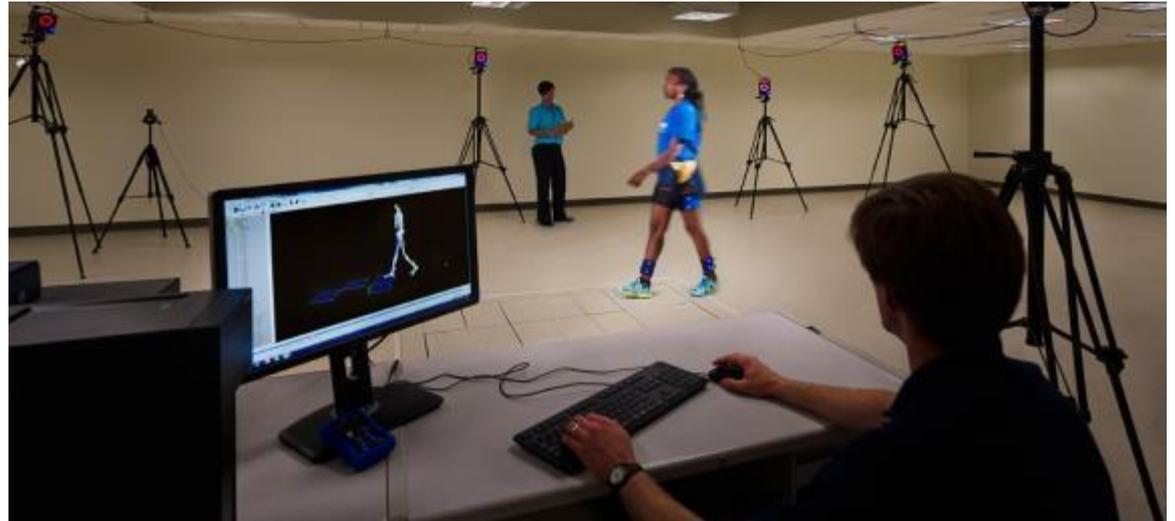
- Persons with degenerative hip and knee problems benefit from physical activity, which is moreover a predictor for symptoms and general health (Ernstgard et al 2017)
- However, non optimal joint loading may contribute to the onset and progression of degenerative joint disease and artificial implant wear (Creaby et al 2010; Wesseling, Corten, Jonkers et al 2015)
- Important to monitor functional status, i.e. functional movement + joint loading, in order to guide rehabilitation advice and evaluate progress after surgical and rehabilitation interventions

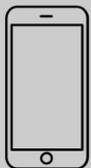
Hip/Knee loading

- Joint contact forces
 - Calculate with musculoskeletal models









Monitor Patient



Raw Sensor data

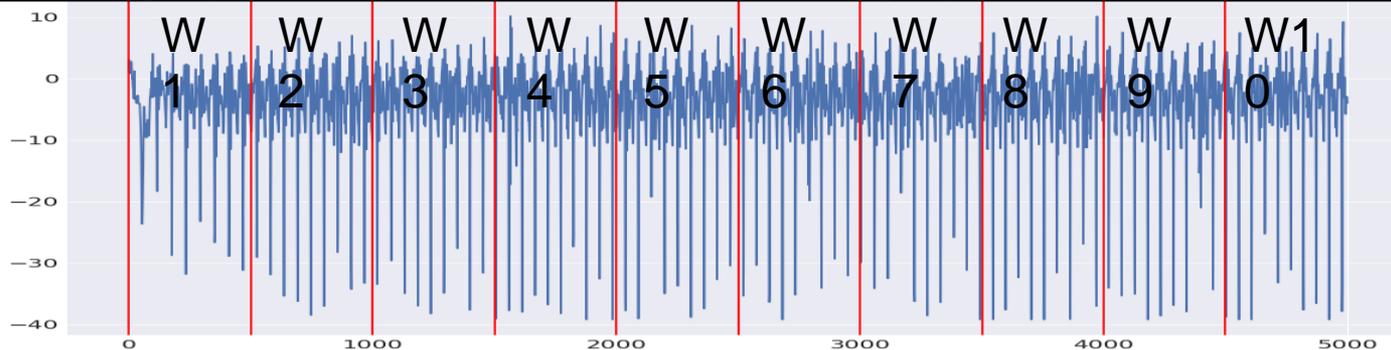


Feature Generation



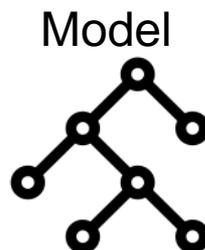
Predictive Model

DTAI KU LEUVEN: ACTIVITY RECOGNITION



Features describe characteristics of the signal

Window	Feature 1	Feature 2	Feature 3	Activity
W1	10	5	12	
W2	15	60	20	
W3	20	45	79	



Predicted Activity

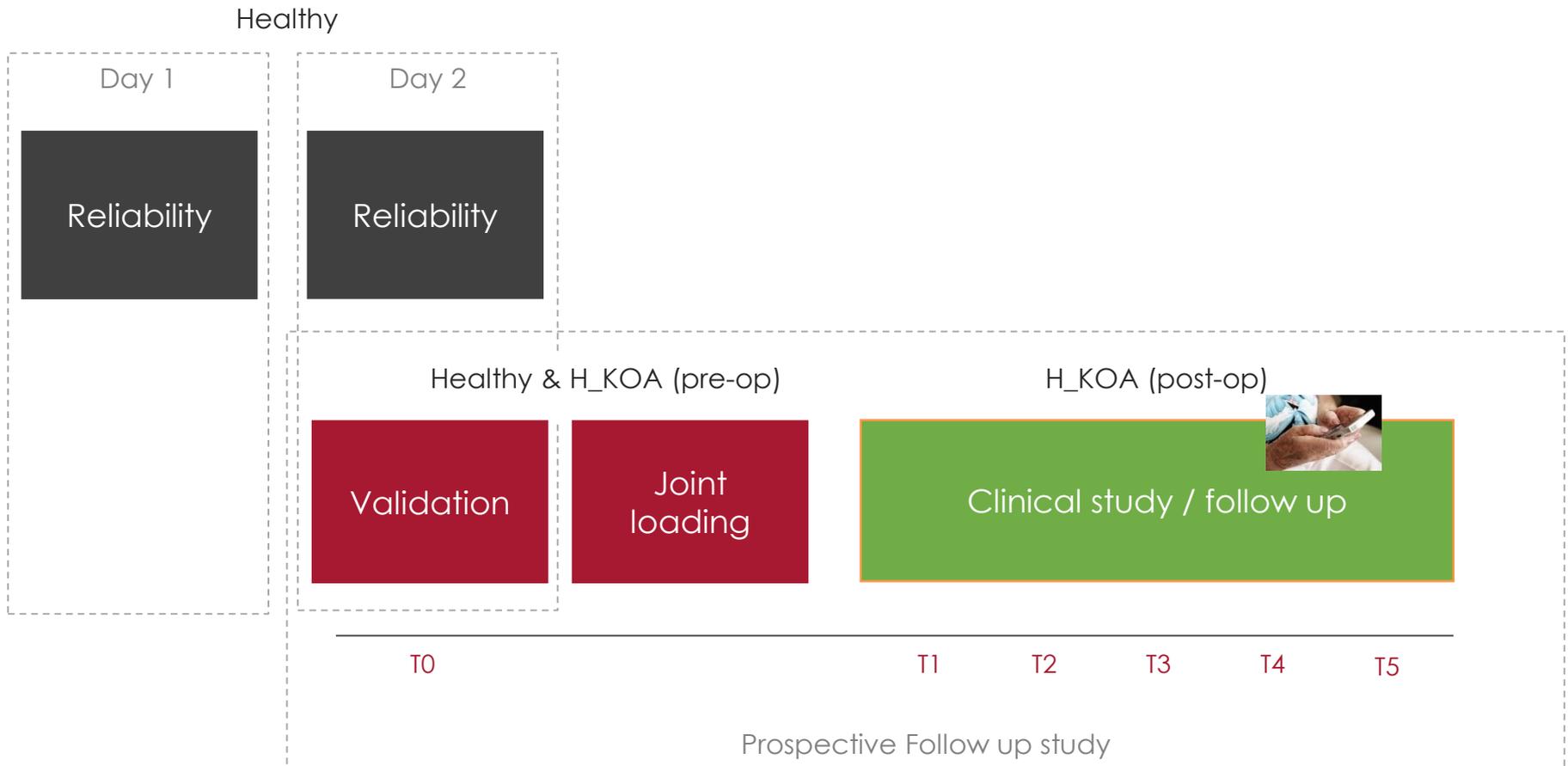


Feedback



- End-users: patients with degenerative joint problems Hip/Knee, medical doctors, orthopedic specialists
- Happy Aging - Lifetech Valley
- Leuvense Kinekring
- Wetenschappelijke Vereniging Voor Kinesithérapie
- Wit gele kruis

Prospective follow up study: functional protocol & smart phone



Clinical Messages

- This project enables the follow up assessment of, and feedback on the functional status in persons with degenerative hip and knee problems
- Current guidelines for physical activity in persons with degenerative hip and knee disorders can be refined by including individual joint loading profiles that are dependent on the movement strategies that are used during functional tasks

