Accuracy of Physical Activity Recognition from a wrist-worn sensor

Cooper K; Sani S; Corrigan L; MacDonald H; Prentice C; Vareta R; Massie S; Wiratunga N

School of Health Sciences & School of Computing Science & Digital Media, Robert Gordon University, Aberdeen

Selfback consortium: NTNU Trondheim, University of Glasgow, Danish National Research Centre for the Working Environment, University of Southern Denmark, Robert GordonUniversity, Health Leads, Trade Expansion
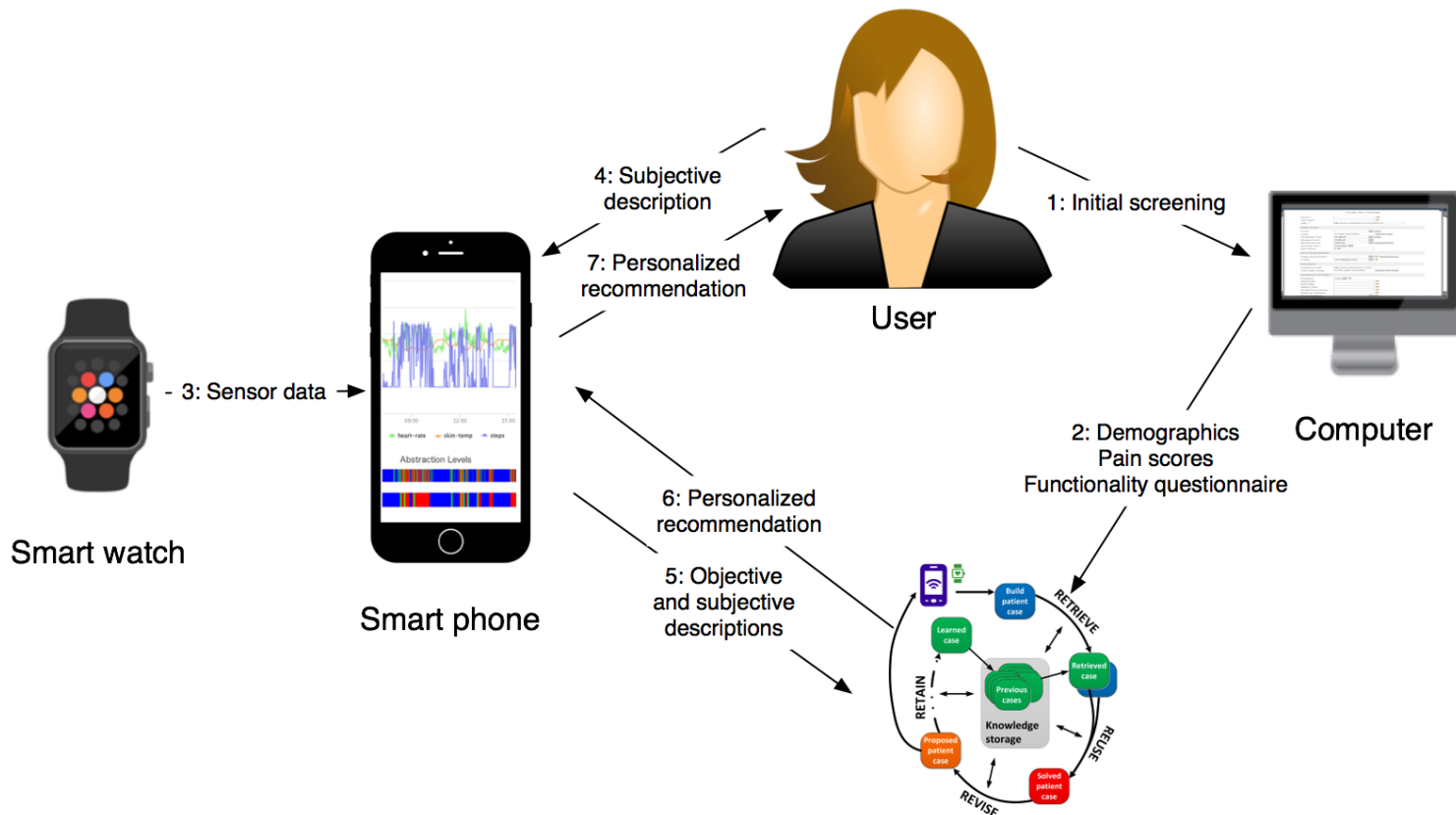
Aims

- Inform PA monitoring to be used in ꜱᴇʟꜰBACK – decision support system low back pain self-management

Methods

- 34 healthy volunteers
- 5 supervised PA protocols
  - Overground walking
  - Treadmill running
  - Stairs
  - Standing
  - Sedentary activities

- Axivity AX3 accelerometers
  - Right anterior thigh (tape)
  - Wrist (wristband)
- Supervised Machine Learning
  - PA Prediction

Results

	Thigh Mean F1 Score	Wrist Mean F1 Score
Running	0.957	0.955
Walking*	0.968	0.906
Sedentary Activities*	0.991	0.935
Standing*	0.979	0.792
Stairs*	0.931	0.710

P<0.01
Paired t-tests

selfBACK

RGU ABERDEEN

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

HORIZON 2020

Conclusions

- Wrist-mounted PA monitoring acceptable for SELFBACK study

- Further work on wrist-mounted PA monitoring required

- Potential as part of digital self-management interventions

www.selfback.eu
k.cooper@rgu.ac.uk