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Preventing the progression of frailty

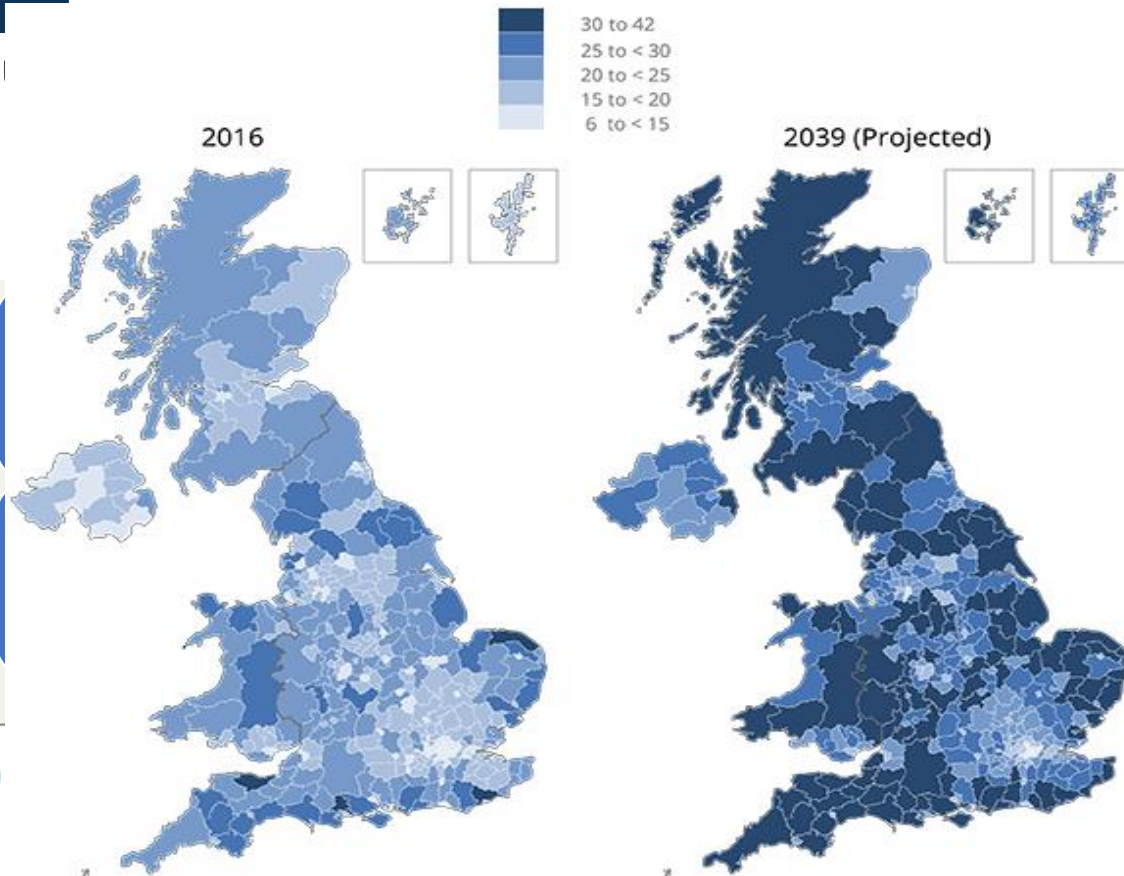
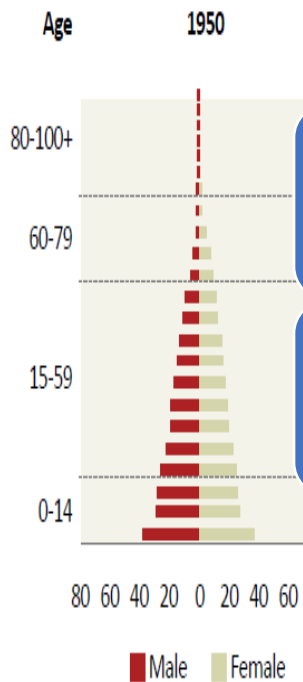
Presenter: Dr Julien Le Kernec
University of Glasgow

Contributors: Abdulrahman Talal Y Alsowail, Maha Yousif A Timraz;
Nathan Phillips, Prof Stuart Gray
Email: julien.lekernec@glasgow.ac.uk, stuart.gray@glasgow.ac.uk

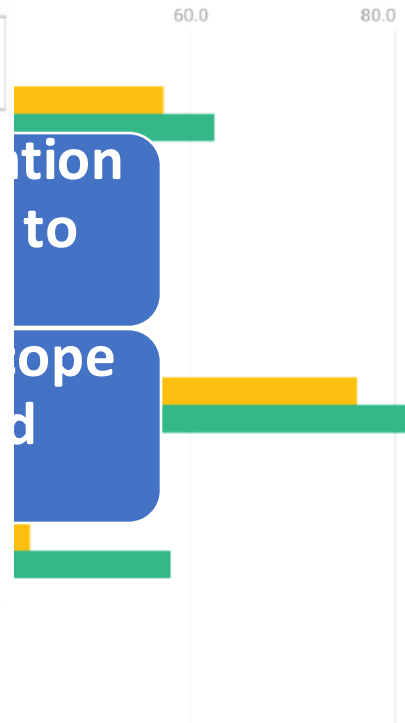
**WORLD
CHANGERS
WELCOME**

THE SUNDAY TIMES
GOOD
UNIVERSITY
GUIDE
2018
SCOTTISH
UNIVERSITY
OF THE YEAR

- Ageing population

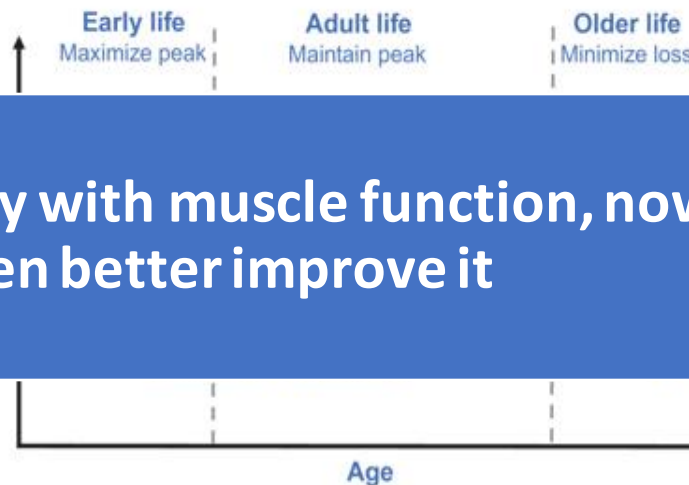


aged countries



As we age, we lose muscle and strength

- After the age of 30, we start to slowly lose muscle



You are all where you are today with muscle function, now let's maintain it or even better improve it

- AS THIS declines, this means we can do less and less
 - Become less independent
 - More fragile

Omega-3

- Can be taken as Fish oil or Cod-liver oil or Krill
- Lots of Health benefits:
 - Healthy heart
 - Good for the brain
 - Improves joint inflammation



Omega-3

- How can Omega-3 fatty acids help?
- Some research has shown that it can help improve strength and function in older adults.
- Even improve muscle mass!
- But....
- Still not much evidence how



What are different sources of Omega-3?

- Fish and other seafood (especially cold-water fatty fish, such as salmon, mackerel, tuna, herring, and sardines)
- krill oil is made from tiny crustaceans called Antarctic krill.
- Some studies have shown that krill oil may be better absorbed by the body and more effective at preventing and improving the risk factors for muscle strength.



Our sponsor – Aker BioMarine

- The sponsor of the research will be providing the Krill oil for the research products.
- They source the Krill from the Antarctic and have a number of sustainable accreditations for their eco-harvesting of Krill

AKER BIOMARINE



Maha Krill and Fish oil study



We are looking for (60) volunteers who are:

- Healthy Aged 60 years or older.
- 16 week supplementation (fish oil, krill oil or vegetable oil).
- Taking a blood sample.
- Doing muscle strength and functional abilities tests .

Volunteers Wanted!

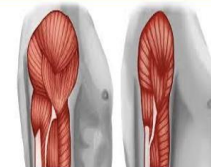
Do you want to help research in muscle ageing?

We are investigating the effects of krill oil and fish oil supplementation on muscle function in older adults.

We are looking for volunteers who are:


- aged 60 years or older.
 - BMI less than 30kg/m²
 - Healthy with no history of cancer, kidney disease, liver disease, diabetes, cardiovascular disease or allergy to seafood.
- Daily supplements will be taken over 16 weeks period.
- We will measure your muscle strength and size before and after the supplements

We will provide you £50 upon completion to compensate you for your time



For further information please contact:

Maha Timraz

 cams-fishkrill@glasgow.ac.uk

Abdul Resistance exercise study

We want to know if the krill oil has any benefits on top of resistance exercise training

- The study will last for 4 months
- We will ask you to visit us 3 times
- We will ask you to perform home exercises and consume either krill or vegetable oil
- We will perform a number of tests (blood sample , muscle size , strength and physical function)



VOLUNTEERS WANTED

Are you over 60 years of age?

We are investigating the effects of krill oil on muscle health after home-based resistance exercises



Participants will get a 50€ voucher on completion of the study

For more information, please contact:

Abdulrahman Alsowail

 koreastudy@glasgow.ac.uk

How to maintain muscle mass?

Resistance
helps main
mass



his

=

Nathan KIPLING study

Can consuming krill oil and protein help improve the muscle-building response?



- Healthy older adults over 60
- 8 weeks supplementation
- Performing resistance exercises in gym twice
- Providing blood and muscle samples
- Strength testing



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AKER BIOMARINE



RESEARCH PARTICIPANTS
NEEDED



KIPLING Study: Effect of krill oil and krill protein following exercise on muscle growth



Taking part in the study will involve:

- Taking a supplement every day for 8 weeks
- Providing muscle, blood and saliva samples
- Performing resistance exercise



If you are interested in taking part in the research or have any questions, please contact



Nathan Phillips
Email : kiplingstudy@glasgow.ac.uk



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GLASGOW

£75 Voucher

General inclusion/ exclusion criteria

- Diabetes
- Severe cardiovascular disease
- Seizure disorders
- Uncontrolled hypertension (>150/90mmHg at baseline measurement)
- Cancer or cancer that has been in remission <5 years.
- Ambulatory impairments which would limit ability to perform assessments of muscle function
- Dementia
- Taking medication known to affect muscle (e.g., steroids)
- Have an implanted electronic device (e.g., pacemaker/defibrillator/insulin pump)
- Prior history of heart, lung, cancer, kidney, endocrine, or liver disease

Maha Krill and Fish oil study

cams-fishkrill@glasgow.ac.uk



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Abdulrahman Alsowail

koreastudy@glasgow.ac.uk

Nathan muscle building study

kiplingstudy@glasgow.ac.uk



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AKER BIOMARINE



RESEARCH PARTICIPANTS
NEEDED



KIPLING Study: Effect of krill oil and krill protein following exercise on muscle growth



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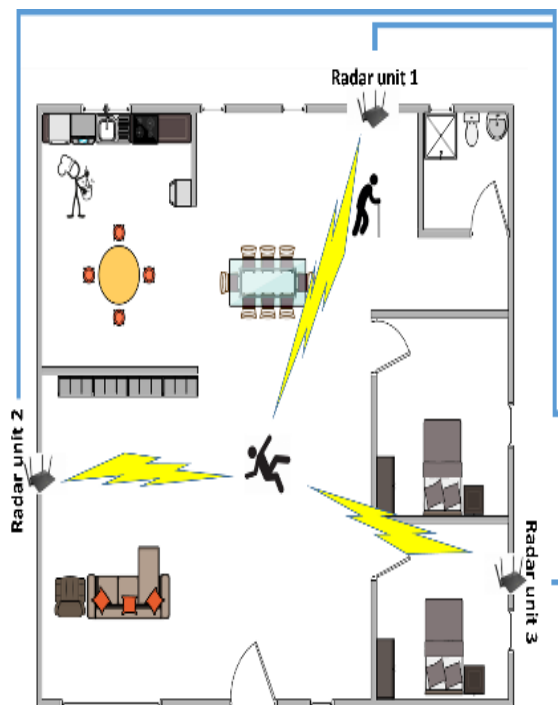


Nathan Phillips
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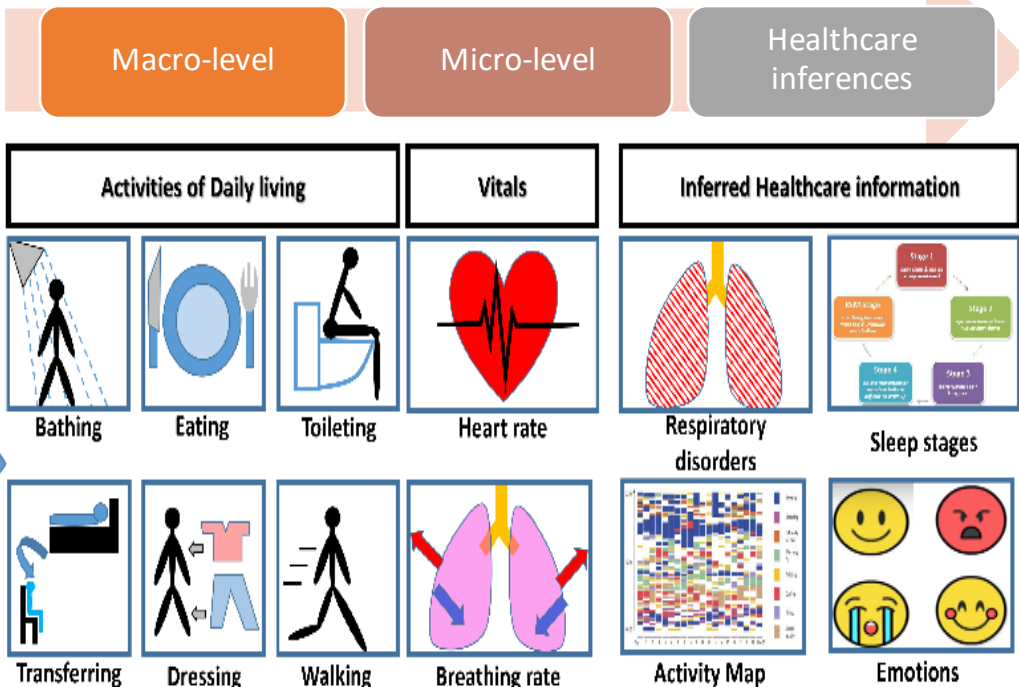
WORLD
CHANGING
GLASGOW

£75 Voucher

How can we monitor people in their homes to enable independent living?



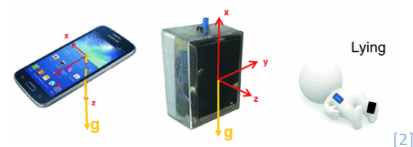
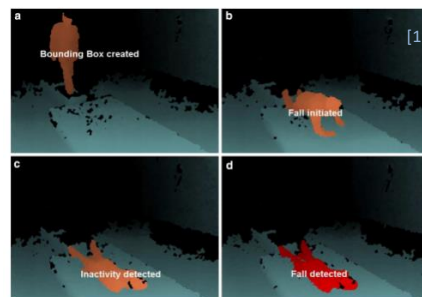
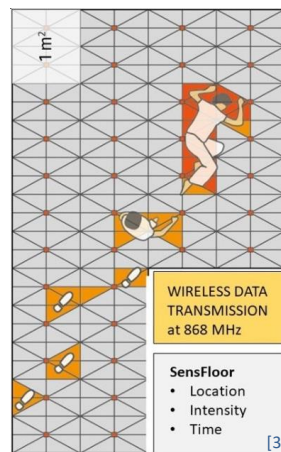
Signal processing + classification



Multifactorial problem

Existing technologies

- Cameras:
 - Depth based camera^[1]
- Wearables:
 - Inertial sensors^[2]
 - Electromyography
 - Wearables^[2]
- Ambient sensors:
 - Acoustic
 - PIRs
- Smart floor:
 - Capacitive sensors^[3]



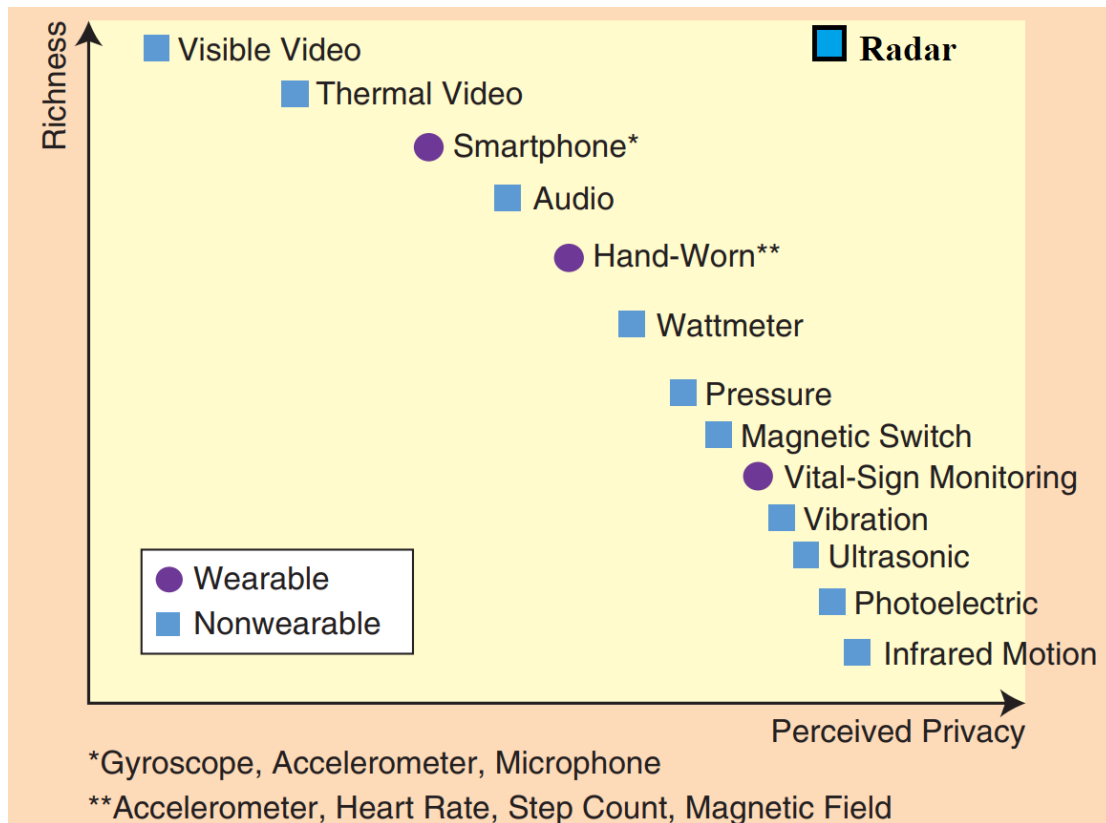
[1] : Mastorakis, G. & Makris, D. J Real-Time Image Proc (2014) 9: 635. <https://doi.org/10.1007/s11554-012-0246-9>

[2]: Basili L., DeMaso-Gentile G., Scavongelli C., Orcioni S., Pirani S., Conti M. (2016) Fall Detection Using Wearable Accelerometers and Smartphone. Mobile Networks for Biometric Data Analysis. Lecture Notes in Electrical Engineering, vol 392. Springer, Cham

[3]: <http://future-shape.com/en/system/>

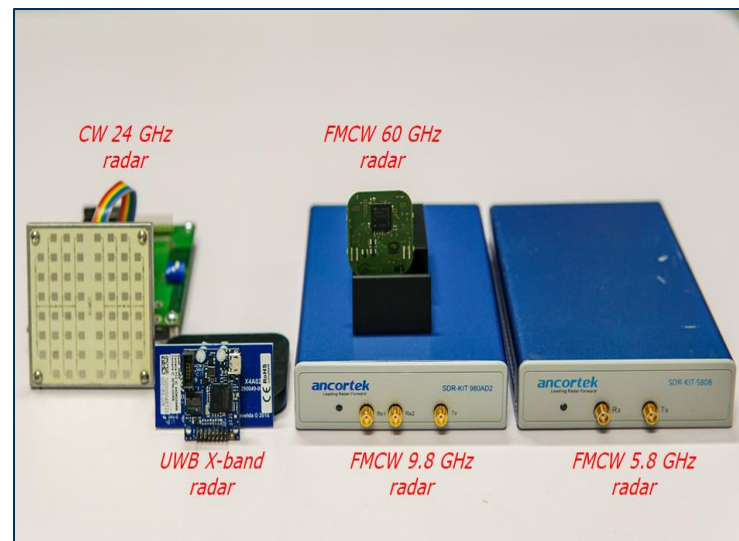
[4] Li, H., Shrestha, A., Heidari, H., Le Kerneec, J. and Fioranelli, F. (2018) A multi-sensory approach for remote health monitoring of older people. IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology, 2(2), pp. 102-108. (doi: 10.1109/JERM.2018.2827099)

Perceived privacy and Richness of information



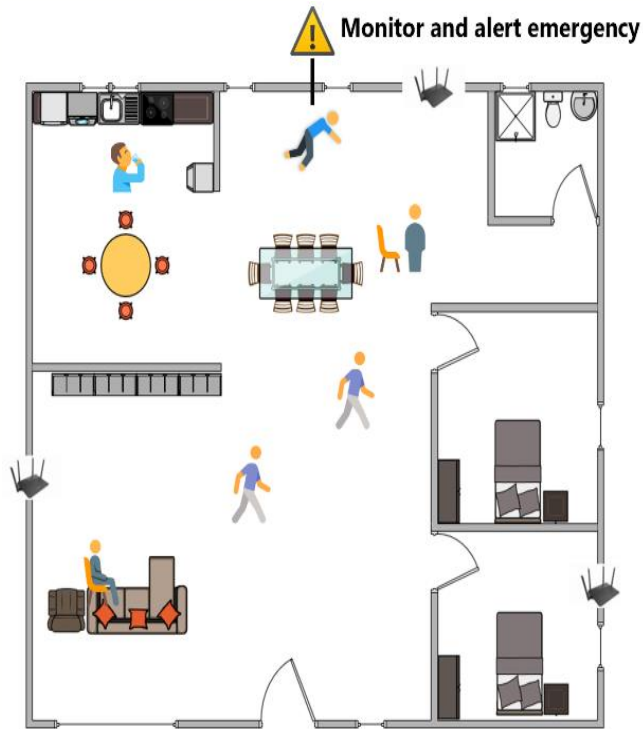
Why Radar ?

- Radar has multitude of benefits compared to the existing technologies:
 - No reliance on user acceptance or compliance.
 - No need to carry or attach devices.
 - No visual recording or identifiable data.
 - No need to remodel environments to install sensors.



Radar systems at CSI group

[1] Fioranelli, F. , Shah, S. A. , Li, H., Shrestha, A., Yang, S. and Le Kerneec, J. (2019) Radar sensing for healthcare. *Electronics Letters*, 55(19), pp. 1022-1024. (doi: [10.1049/el.2019.2378](https://doi.org/10.1049/el.2019.2378))



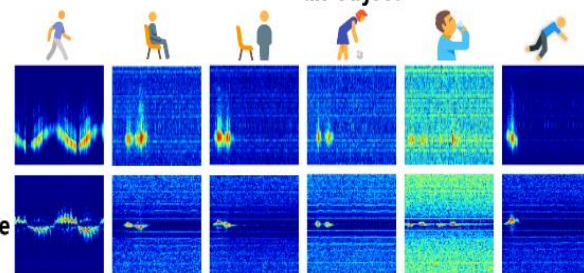
Radar-based in-home human activity recognition for older adults living independently

① **Adaptive activity recognition**

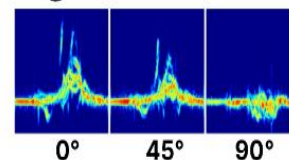
Walking Sitting Standing Picking an Object Drinking Falling

Range-Time

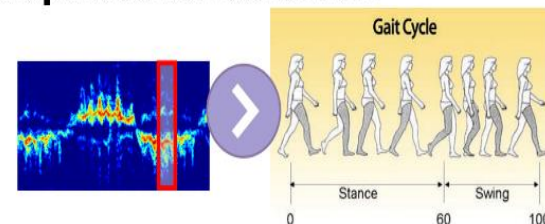
Doppler-time



② **Recognition robustness to angle variations**

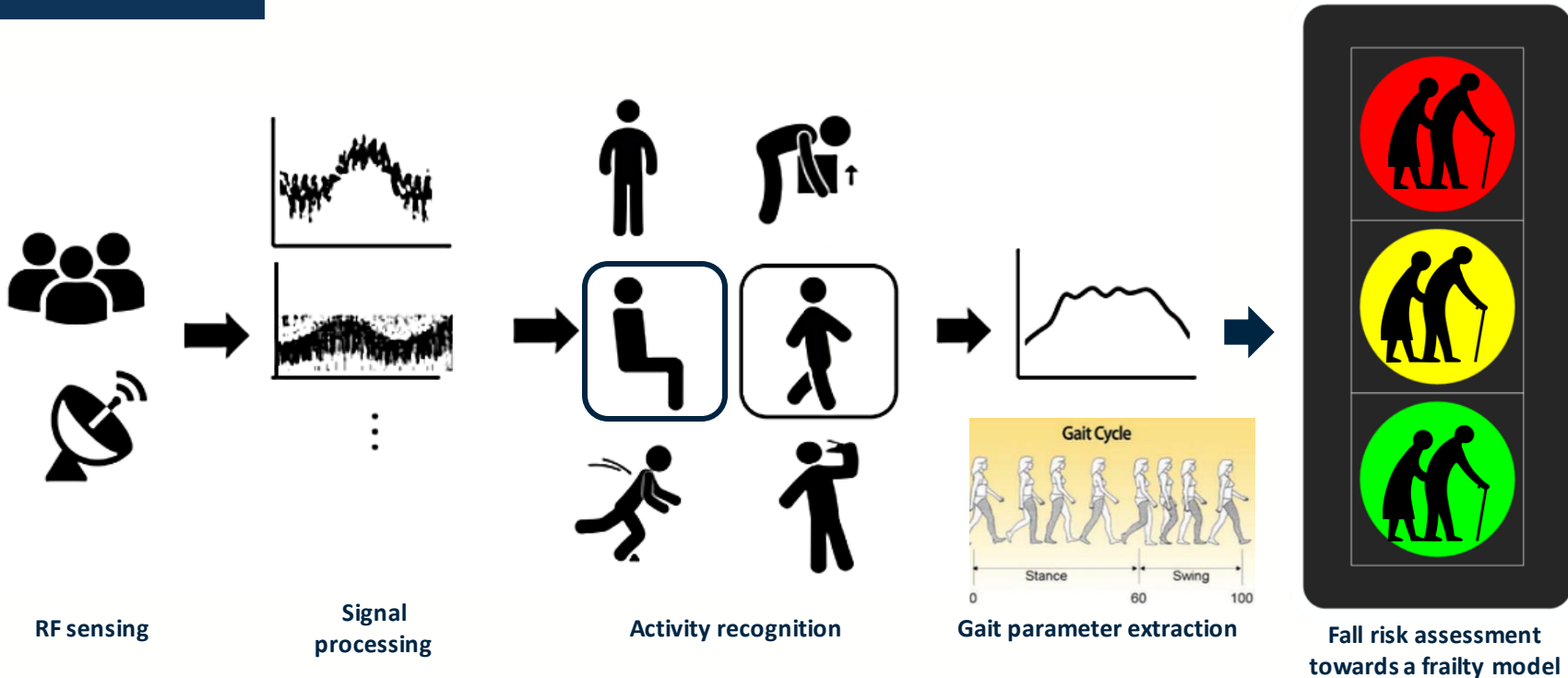


③ **Gait parameter extraction**

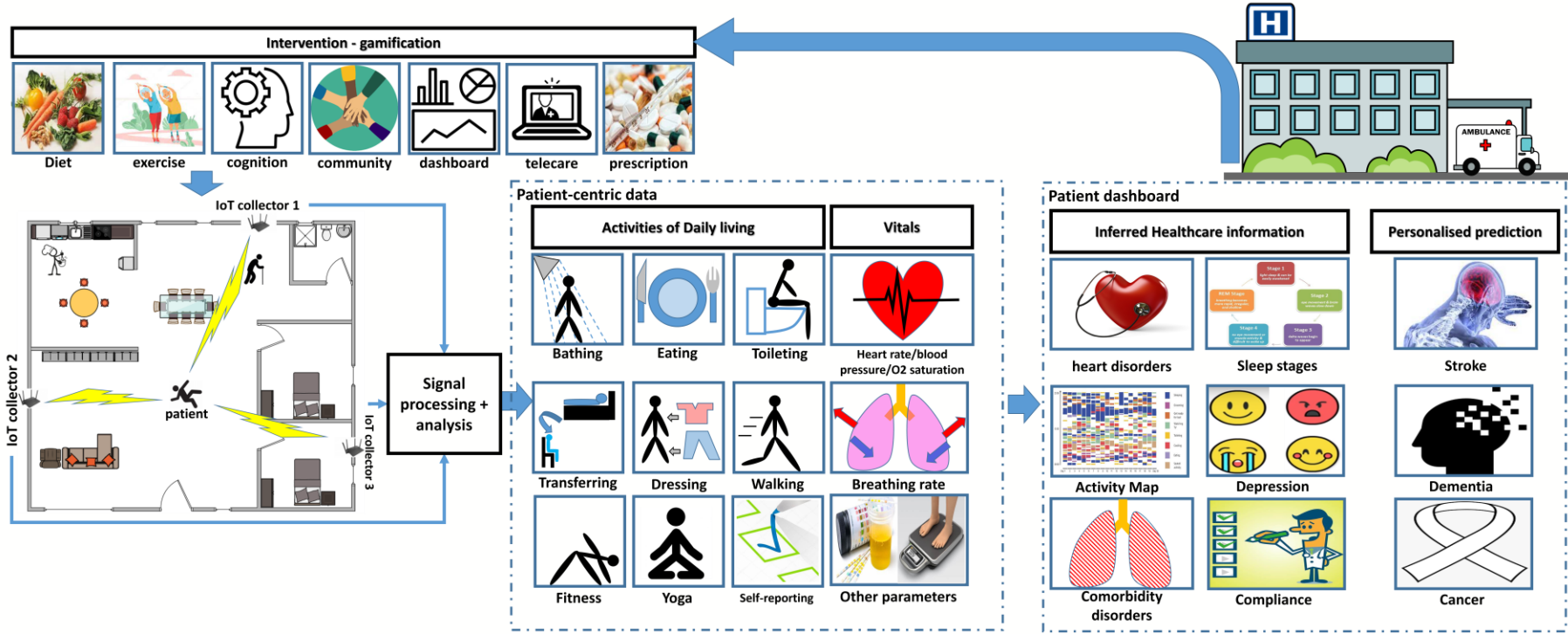




Frailty assessment



sensing in assisted living from reactive to predictive





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www.glasgow.ac.uk/about/campus