

“Digital Health Revolution – SPHERE”

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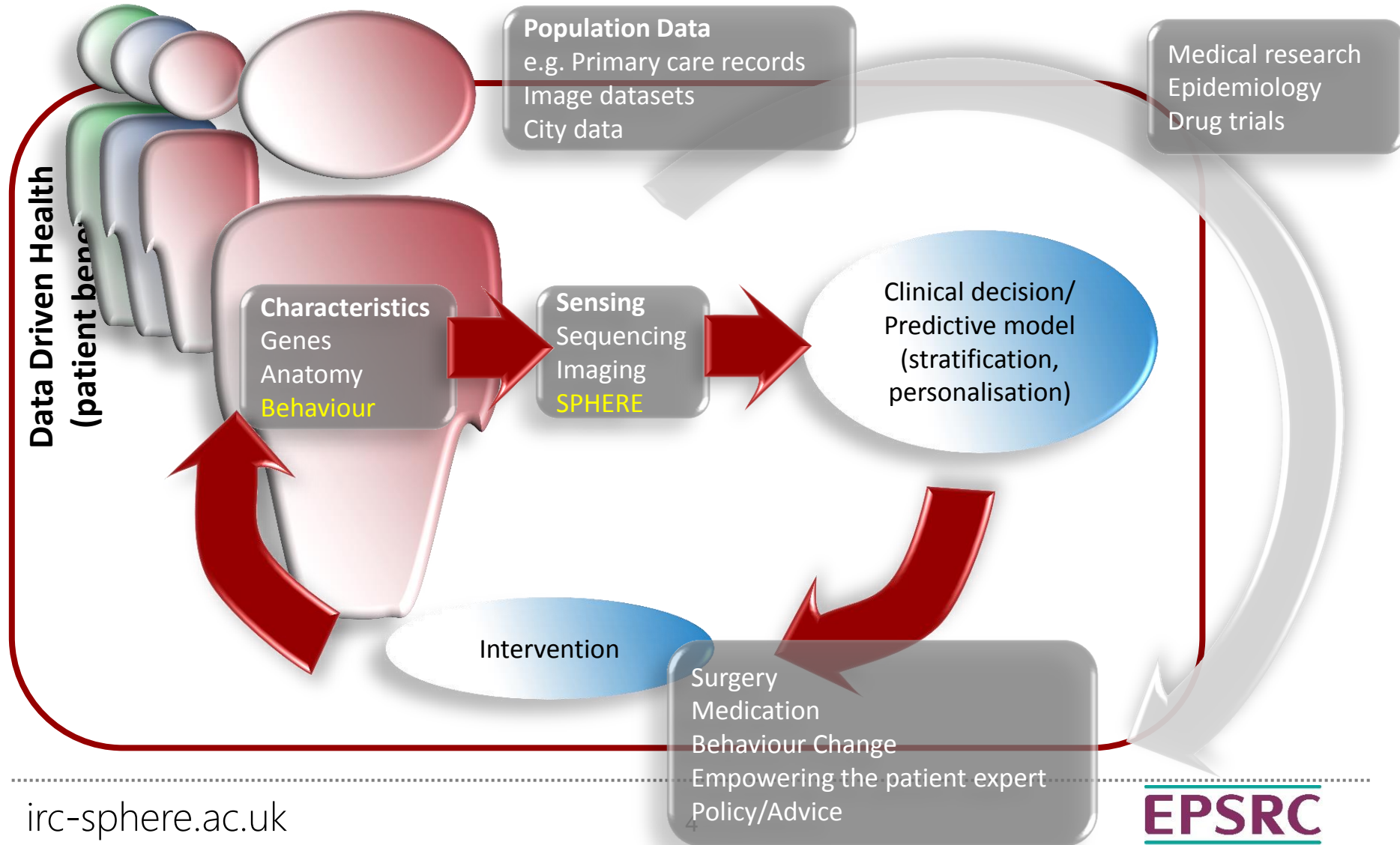


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- A Sensor Platform for Health in a Residential Environment (SPHERE)
- £15M from EPSRC (UK basic science/engineering funder).
- October 2013 – October 2018.
- ~100 researchers on the project.

**Data Driven Health
(patient benefit)**



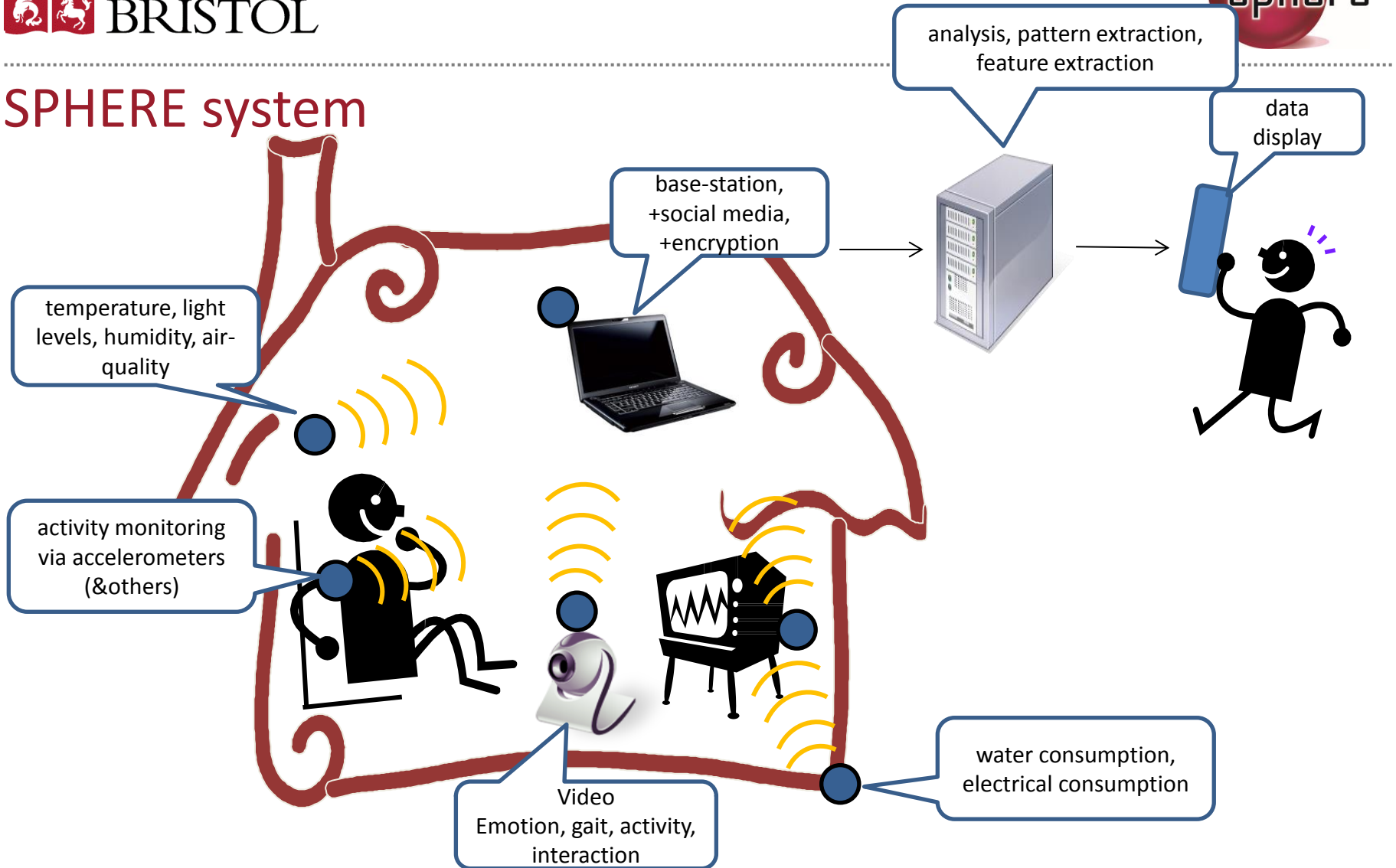


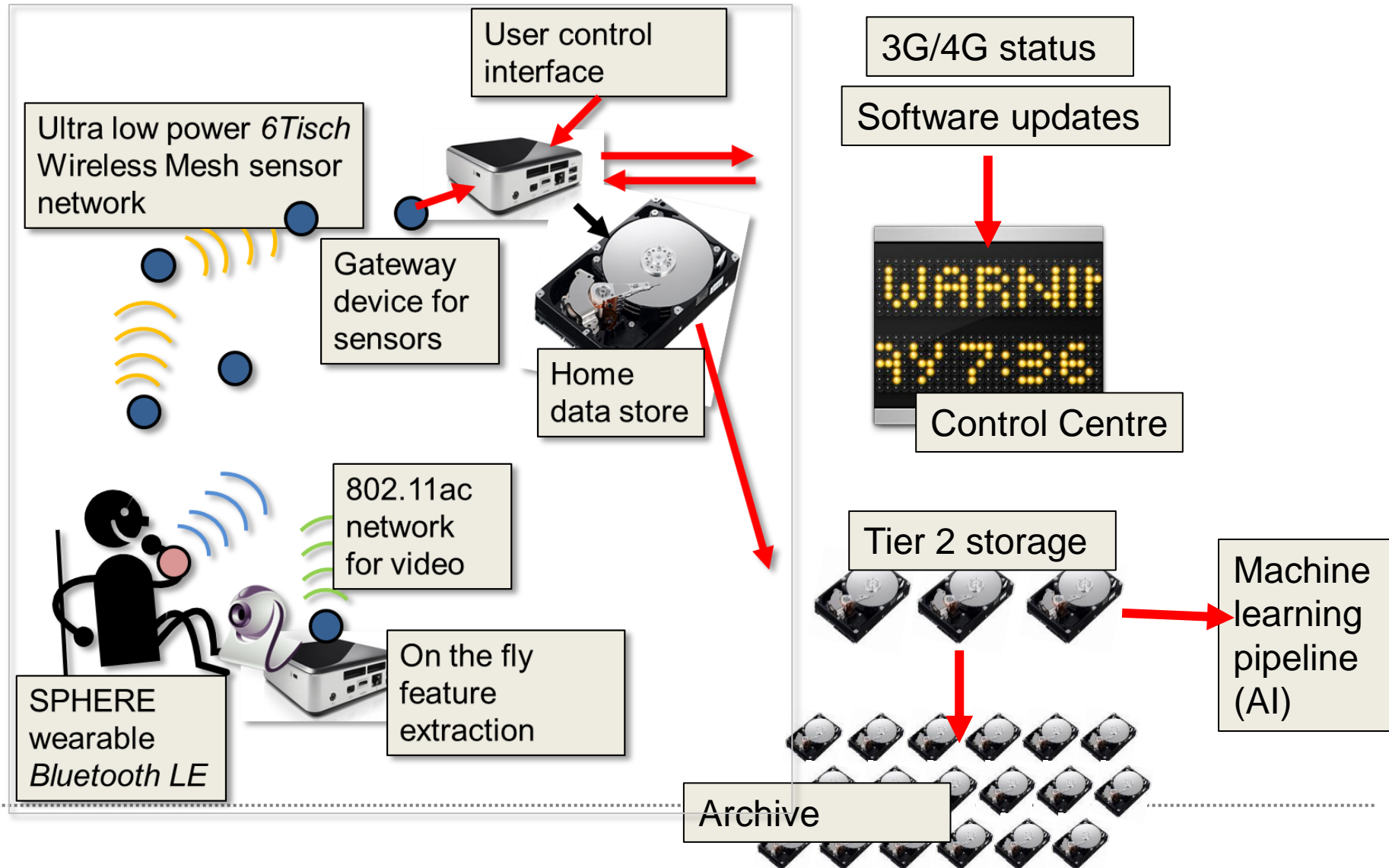
Digital Technologies for Behavioural Sensing

SPHERE's question:

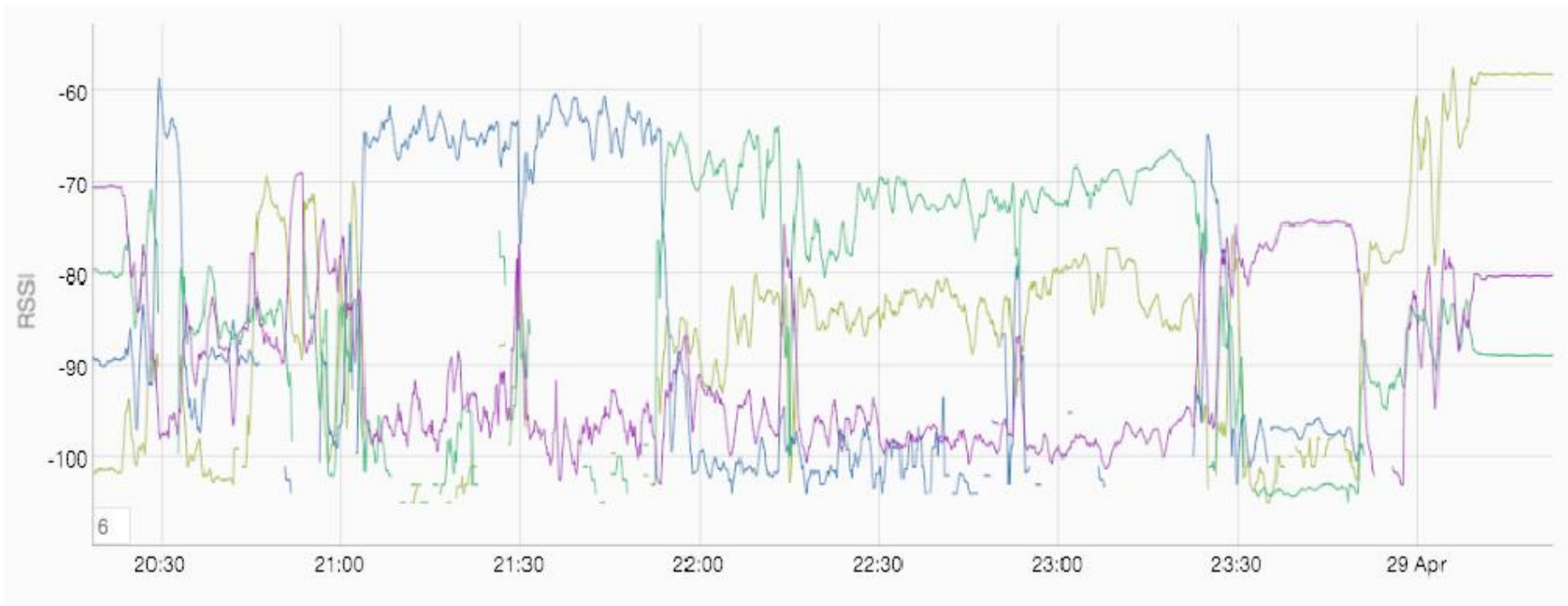
- What is the best environment for acquiring health-related behavioural data?
- What will eventually be the best sensor platform for acquiring it?
- ... and doing some research to achieve that
- ... and demonstrating it

SPHERE system





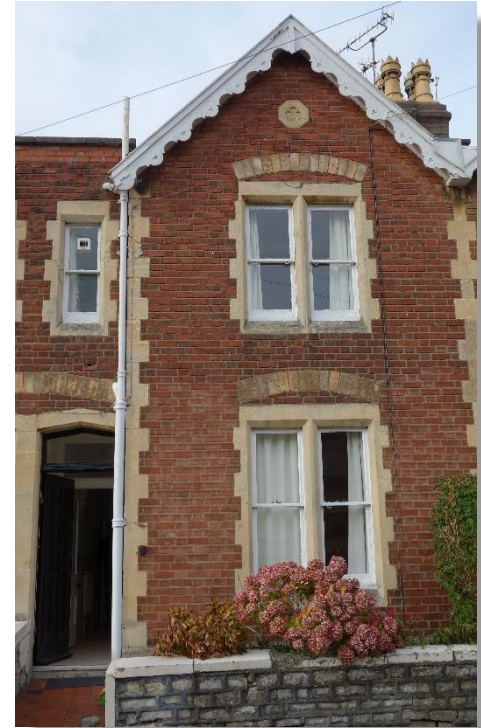
Localisation and Machine Learning



SPHERE House, Bristol

- House sensor platform is complete.
- Cost of installation ~£4k.
- Cost of operation is negligible.
- A unique system for behavioural monitoring.
- For each person in the house*
 - What activity?
 - Where are they?
 - What quality of activity?
- Burden/intrusion for participant is negligible/zero*.

** = insert caveat here.*



SPHERE 100 Homes

- SPHERE scales up to **100 home deployment** in 2017.
 - 20 surgical
 - 40 families and couples
 - 20 epidemiological
 - 20 sheltered housing
- **Learning how to do this research** (experiment design, data management, user acceptance, ethics process, skills training for researchers).



The Big Picture

- The main outcome for SPHERE will be the creation of a bespoke, integrated, synchronised, flexible and scalable sensor platform for capturing and mining human behaviour at home, over long periods and in large populations.
- Multi-sensor approach is inevitable and gives more insight than smartphone/wristband sensing.
- With access to this information what will society do with it:
 - Management of long term conditions (self care)?
 - New epidemiology?
 - Discovery of behavioural biomarkers (e.g. in dementia)?
 - New options for programmes of behaviour change?

Conclusions

- SPHERE has been designed from the outset as low-cost health-behaviour sensing system for long-term use in the home.
- It is very powerful (but imperfect, like any technology) and will be used at scale in the coming years.
- SPHERE is keen to work with experts who are interested in accessing the data, deploying the system in clinical or research studies.
- Opens a window into the likely future role and capability of consumer technologies.

- Thank you
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