

The HomeSense project

Making it easier and more productive for social researchers to use digital sensors and understand sensor data.

Demonstrate the use of sensors via household trials

Catalogue technical, methodological and ethical issues

Create guidelines for using sensors



Development and adaptation

Issues of practicability and dependability

Ultra-thin 8mm battery

Battery capacity: 41 mAh
Battery type: lithium polymer
Input current: 25 mA(TYP)
Input voltage: DC 5.0 V



Military-grade
accelerometer by ADI

Premium-quality
Bluetooth® chip by
Dialog

Bluetooth® version: 4.0



Microphone

Ranging sensor

Particulate sensor

Temperature & humidity

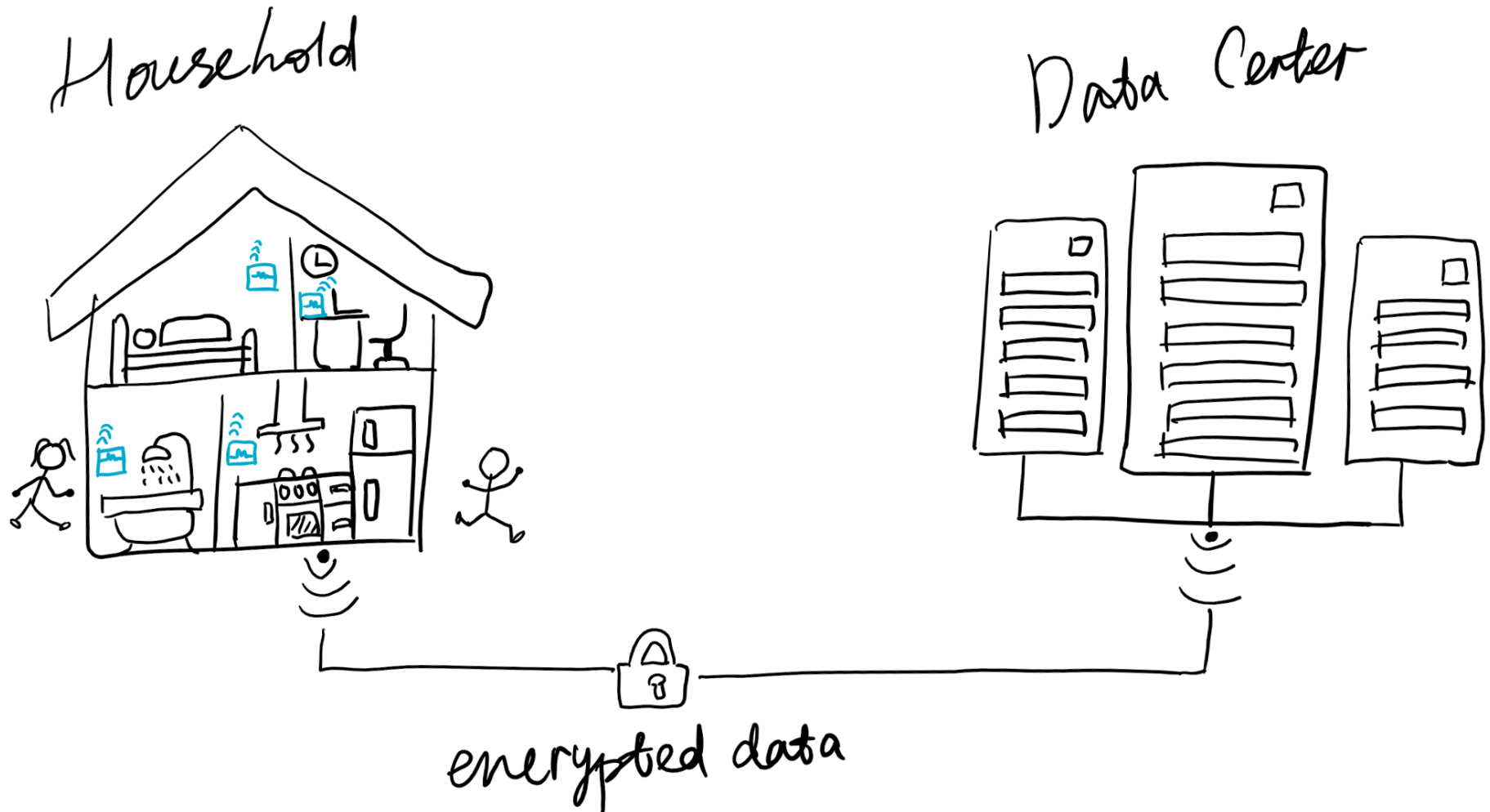
RGBC Light & gesture sensor



WiFi™

Development and adaptation

Issues of data transmission and security

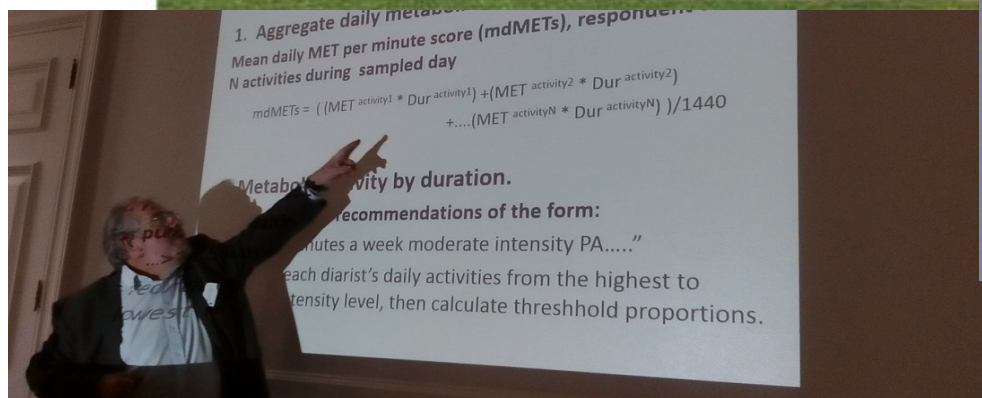


INSIGHTS: bringing together sensor technology and social research



Workshop

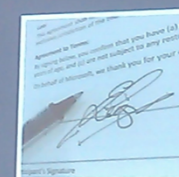
London, 20-21 June 2016



Implied Consent

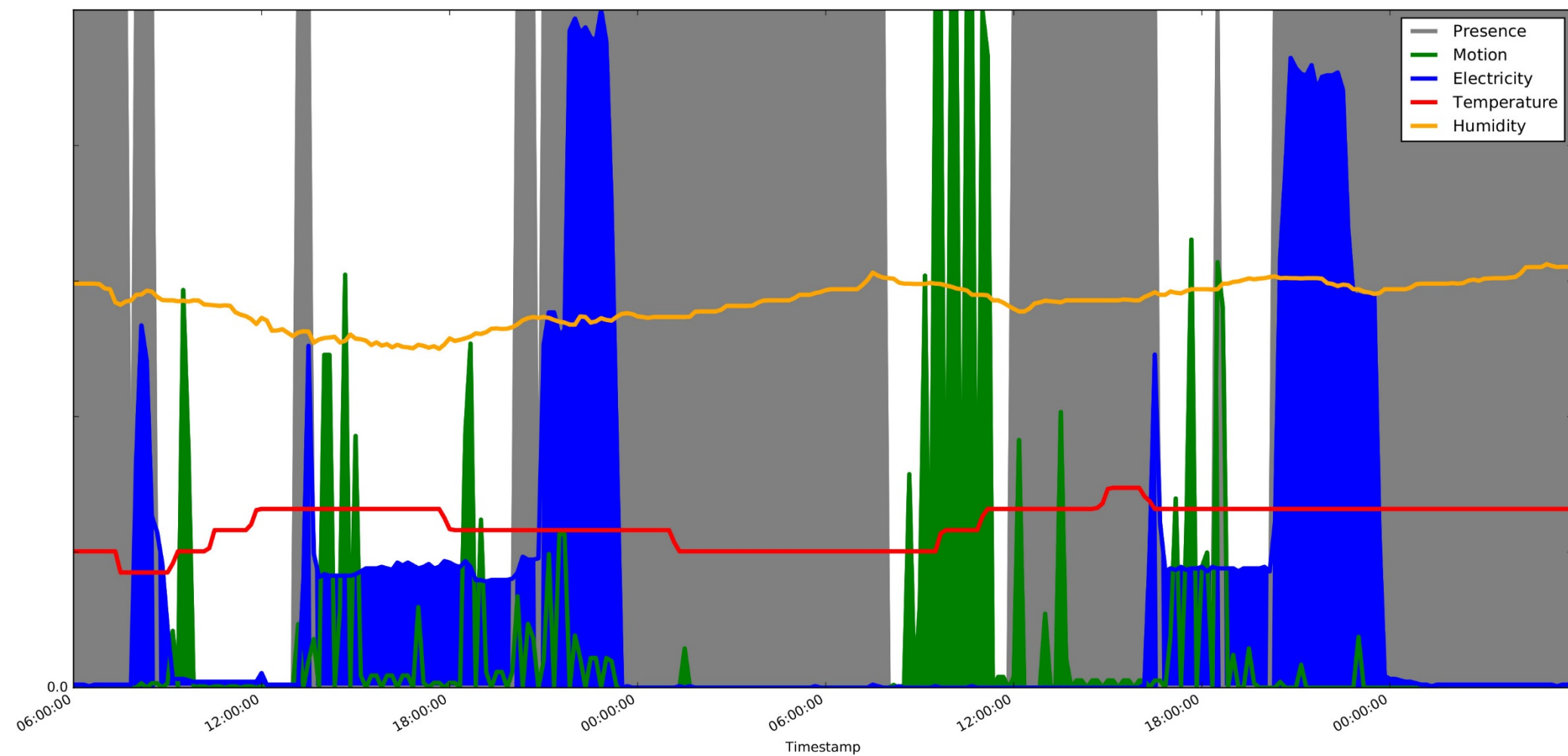


Explicit Consent



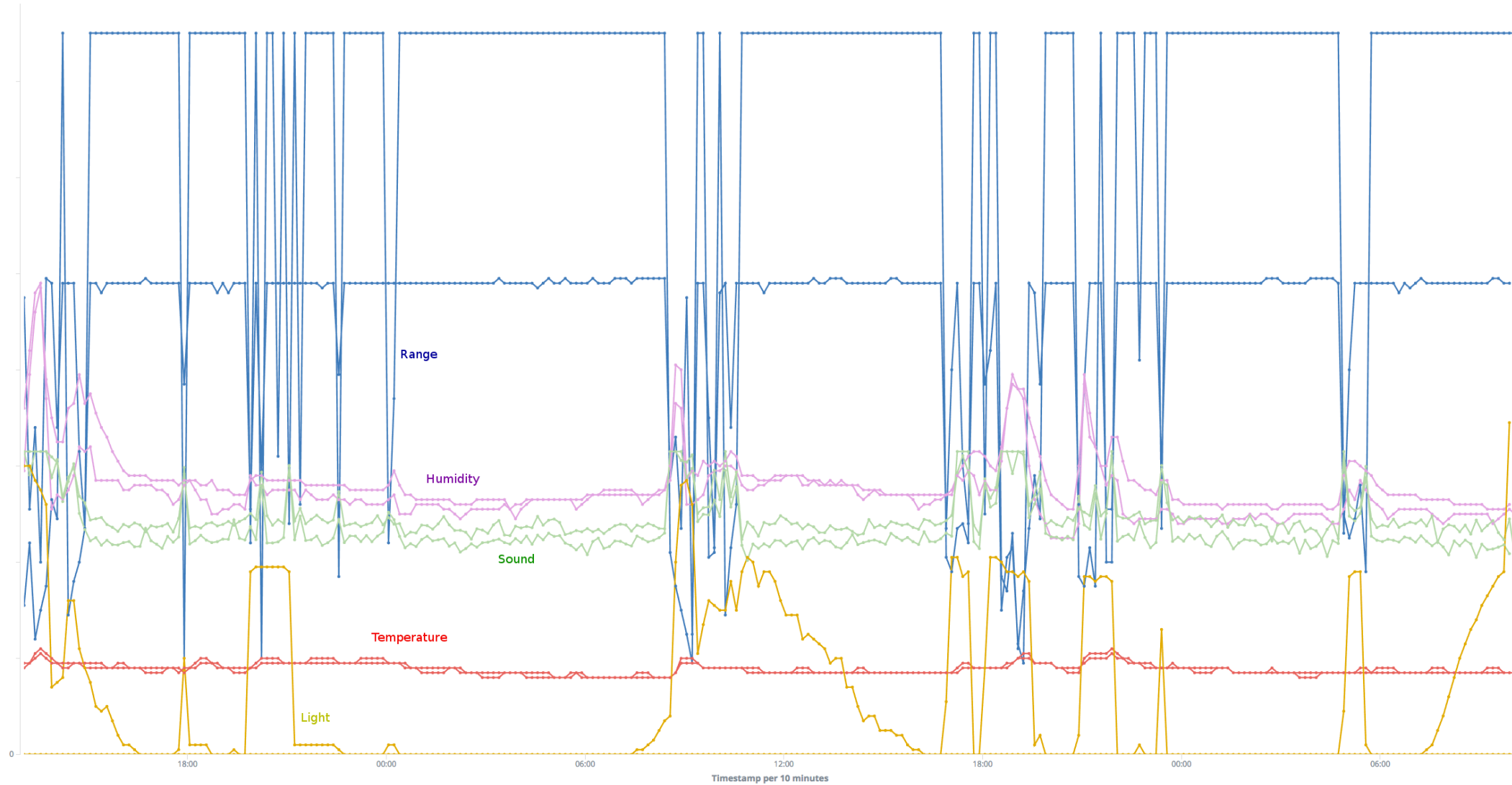
Testing: in a bedroom + study

From 23 Sept 6:00am until 25 Sept 6:00am



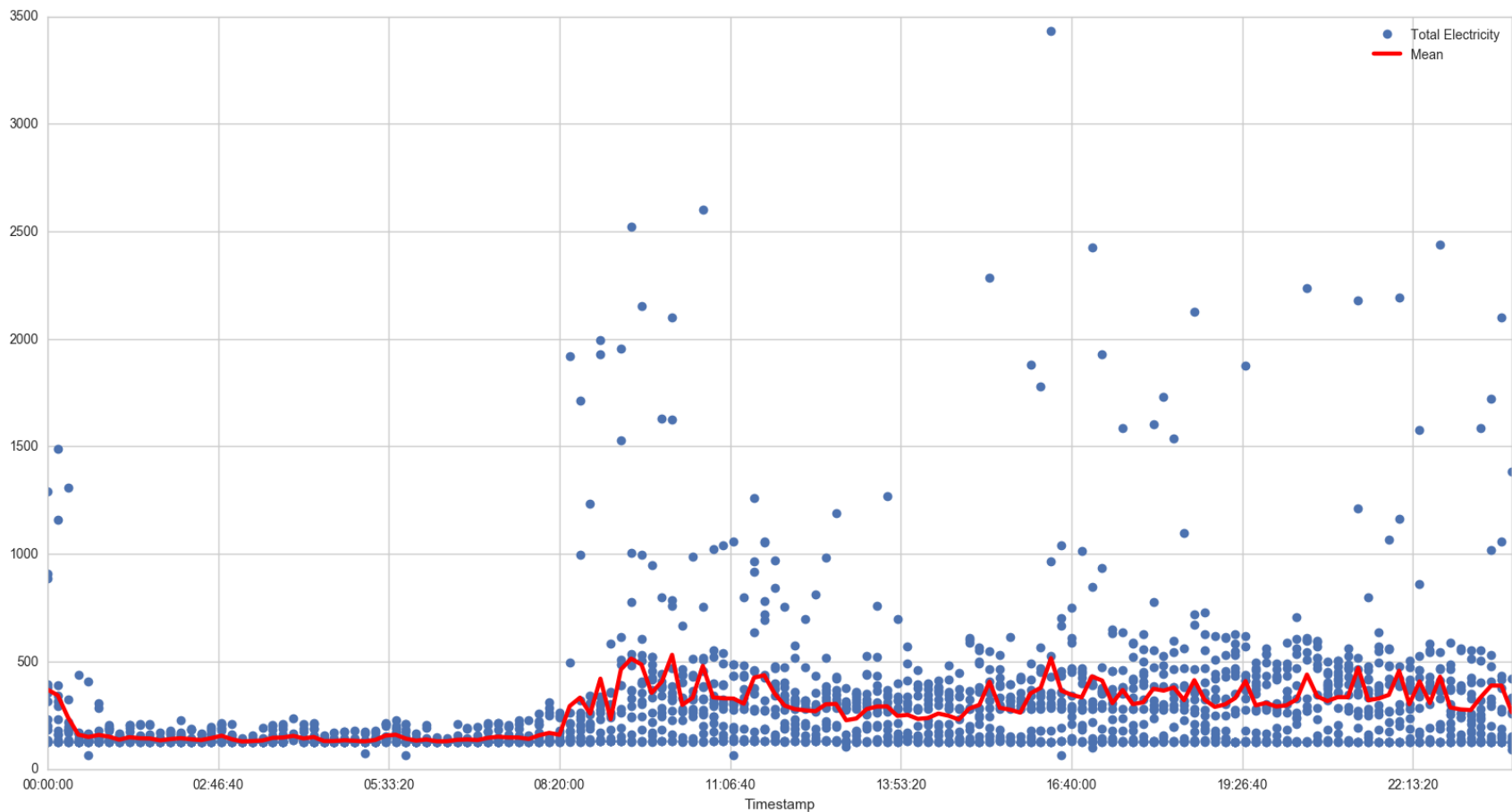
Testing: 45 hrs in a kitchen

From 26 Nov 1pm to 28 Nov 10am



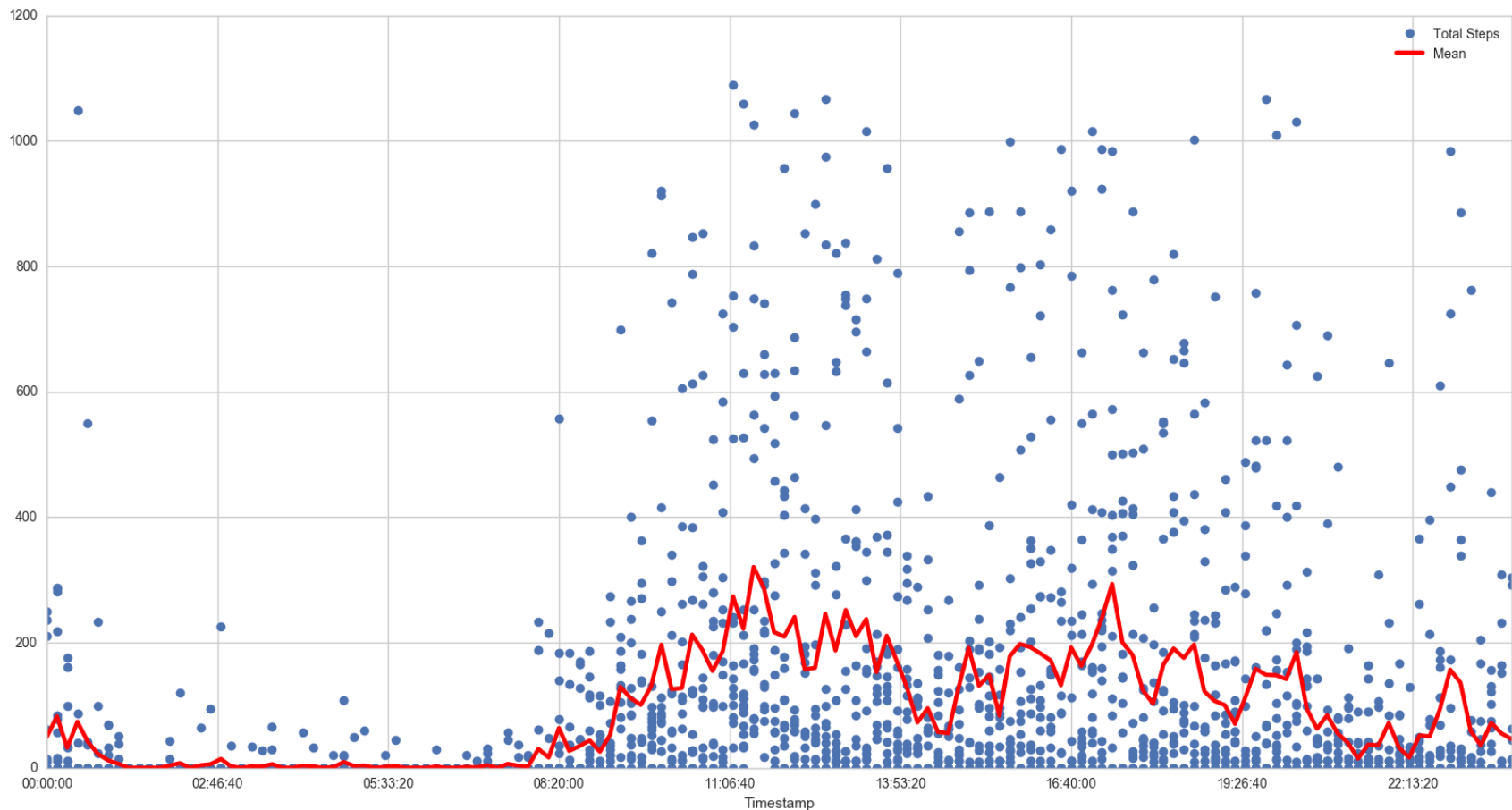
Testing: electricity daily distribution

From 05-12-2016 to 05-01-2017



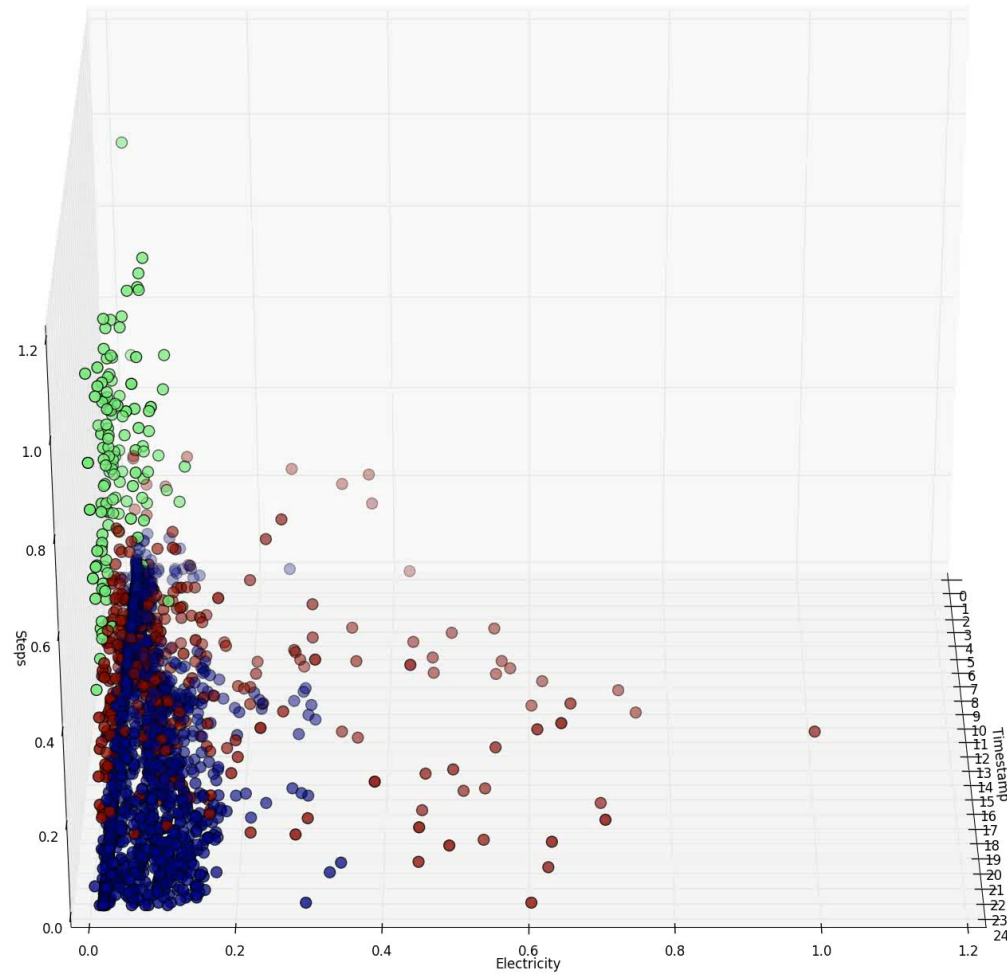
Testing: motion daily distribution

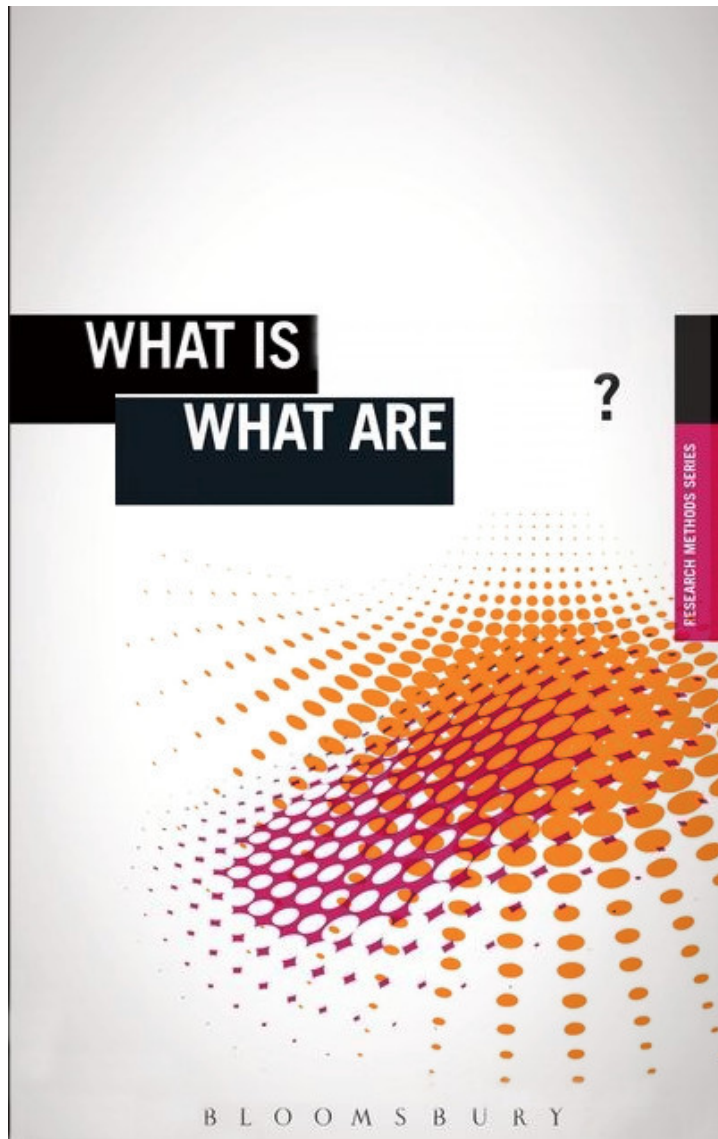
From 05-12-2016 to 05-01-2017



Clustering: Time-Electricity-Motion

From 10-12-2016 to 25-12-2016





'What is?' Research Methods series

Graham Crow (ed.) University of Southampton

What are sensors in social research?

1. Introduction

Key terms

2. Thinking critically: why use sensors?

What kind of data do sensors generate?

What is your research question?

What is the added value in sensor-generated data?

Mixing methods: sensors and ethnographic methods

Thinking creatively, asking questions

3. A cross-disciplinary research method

What do you need to know to choose and use sensors?

Relying on the expertise of others

Communicating aims and purposes

What are the benefits of cross-disciplinary research

4. Technical considerations

Choosing what to observe and how

Adapting sensors and other research instruments

Electronic data collection techniques

Data transmission, storage and security

Accessing sensor-generated data

Visualisation techniques

Issues of recruitment and participation

Installing and monitoring sensors

Data-processing and data-analytic techniques

Mixing methods: other data sources

Interpreting sensor-generated data

The Data Management Plan

5. Ethical considerations

What is sensitive about sensor-generated data?

Preparing the ethics approval application

Consenting to direct and indirect participation

Incremental consent

Confidentiality and anonymity

User/participant engagement

Data views and data sharing

Understanding the risks

Facing ethical dilemmas

6. Where next in using sensors?

The Internet of Things and ubiquitous computing

Data mining, data sharing, data protection

Debating the right to passive observation

Developments in participatory methods

Clarity of purpose

Sensors everywhere ?

Further reading and resources

References

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HomeSense timeline

2016

1st February: Start date

February / March:

- Started testing wristbands
- First prototype test of the IoT Egg
- Reviewed the state-of-the-art in tracking, time use, profile analysis, etc.

April / May:

- Set up database
- Developed data processing and visualization techniques

June: Bloomsbury workshop

- Developed quantitative and qualitative research instruments

July / August:

- Drafted data collection guidelines
- Prepared and submitted ethics approval application

September / October:

- Tested sensors and other methods in 'friendly' household
- Liaised with meet-ups and other relevant groups to publicise HomeSense

November / December:

- Second pilot test (comprehensive)

January / February:

- Ethics approval
- Start recruitment

2017

March / April:

- Fieldwork
- Data collection and visualizations
- Submit book proposal

May / June:

- Fieldwork
- Data collection and visualizations
- Start developing data-analytic techniques

July:

- First NCRM course