

Title of Study: Data Probes

Invitation and Brief Summary

You are being invited to take part in a research study. Before you decide whether or not you wish to take part it is important that you understand why the research is being done and what it will involve. Please read this information carefully and discuss it with others if you wish. Take time to decide whether or not you wish to take part. If you do decide to take part, you will be asked to sign a consent form. However, you are free to withdraw at any time, without giving any reason and without any penalty or loss of benefits.

What is the purpose of the research?

This study forms part of our research exploring how we can help make some of the hidden aspects of modern technology more visible and transparent to the people who use them.

The purpose of this study is to help support participants in reflecting on the data being generated around them and the capabilities of internet-connected products by giving them ways to examine the types of data that modern smart devices can capture.

The insights we gain from this study will be used to inform the design of new concepts for internet-connected products that emphasise transparency and accountability in how they operate.

What does taking part involve?

You will be given a small device called a Data Probe that uses several sensors to collect different types of data and presents them to you in a way that you can interpret and try to understand. All of these sensors are commonly used in modern mobile phones and other smart devices.

- ☐ An ambient light sensor that detects how bright or dark the area around the device is. For example, this would register different levels of light during the day and at night, or when something casts a shadow on it.
- ☐ A microphone that measures how loud or quiet the area around the device is in different frequency ranges, but does **not** record sound. For example, it might show different readings for traffic and speech.
- ☐ A GPS chip that determines location and speed, but with a limited precision. For example, it will not pinpoint an individual house.
- ☐ An accelerometer that measures how much the device is moving. For example, it would show different readings when standing still or walking.
- ☐ A chip that detects nearby Wi-Fi networks, but does **not** connect to them or to the internet. It would show the names of Wi-Fi networks you have been close to.

You will be able to examine this data, but only you will have access to it — not even the research team will be able to access this data.

The study will last for one month and there will be about eight people taking part. We will meet weekly via Zoom to discuss and interpret our data together. You will be given suggestions for things to do that might cause interesting changes in your data, and we'll also work together as a group to set interesting tasks.

There may also be short individual interviews at the end of the project.

What information will be collected and who will have access to the information collected?

The Data Probe Device

The Data Probe device will collect a few different types of data:

- ☐ A list of numbers indicating how bright or dark the area around the device was at different times
- ☐ A list of numbers indicating how loud or quiet the area around the device was at different times
- ☐ A list of numbers indicating the rhythm of movement or stillness of the device at different times
- ☐ A list of GPS coordinates indicating the device's rough position at different times
- ☐ A list of wireless networks that the device has been close to

Each of these sensors will have an individual physical switch to turn them on or off. You can do this at any time, even if we've asked you to use a particular sensor as part of a task.

Only you will have access to the data on the device unless you choose to share it with someone else. The device is not connected to the Internet and will not send the data to us or anybody else. The data will be stored on a removable SD card on the device. At the end of the study, you will remove and keep the SD card. You can either destroy it or use the SD card as you see fit.

Group Discussions and Interviews

We will also record the group sessions and any interviews. These will be stored securely in Newcastle University's OneDrive cloud storage, then transcribed and made anonymous so that you can't be identified, and then the original recordings will be deleted. Only the research team and transcription service will have access to the recordings.

Our funder requires us to make publicly funded research data available to the public. If you agree to take part in the research study the recording transcripts will be de-identified and made available as "open data" through the university's research data repository. This means the de-identified study data will be publicly available and may be used for purposes not related to this study. It will not be possible to identify you from the "open data".

Contact Details

We will use your name and contact details (telephone and email) to contact you about the research study. This data will be kept on university laptops and/or the university's OneDrive cloud storage. Individuals at Newcastle University may look at your research data to check the accuracy of the research study. The only individuals at Newcastle University who will have access to information that identifies you will be individuals who need to contact you to arrange research activities or audit the data collection process.

Demographic Details

Basic demographic details will be collected in order to help us create a diverse cohort of participants. These details may also be used anonymously in reporting on the project's findings.

Why have I been invited to take part?

We are inviting members of the general public rather than any specific population group. We will attempt to ensure the group represents different backgrounds and experiences.

What are the possible benefits of taking part?

The research is not expected to have a direct benefit to you. It is intended to contribute to knowledge about how people understand the data being collected by popular IoT devices. In the long term, this may contribute to

the design of more transparent and trustable internet connected devices. However, we do hope that taking part will be educational and give you some interesting new insights into sensors and data.

What are the possible disadvantages and risks of taking part?

We do not believe that there are possible disadvantages or risks of taking part.

Who is the sponsor and data controller for this research?

Newcastle University is the sponsor for this study based in the United Kingdom. Newcastle University will be using information from you in order to undertake this study and will act as the data controller for this study. This means that Newcastle University is responsible for looking after your information and using it properly.

The lawful basis for carrying out this study under GDPR is Task in the Public Interest, (Article 6,1e) as research is cited as part of the University's duties.

Your rights to access, change or move your information are limited, as Newcastle University need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, Newcastle University will keep the information about you that has already been obtained. To safeguard your rights, the minimum personally identifiable information will be used.

You can find out more about how Newcastle University uses your information at <https://www.ncl.ac.uk/data.protection> and/or by contacting their Data Protection Officer at rec-man@ncl.ac.uk

Who is funding this research?

This research is funded by the PETRAS National Centre of Excellence for IoT Systems Cybersecurity.

Has this study received ethical approval?

This study has received ethical approval from the University Ethics Committee on 30th March 2022.

Who should I contact for further information relating to the research?

The Principal Investigator is Dr Nick Taylor, who can be reached at nick.taylor@newcastle.ac.uk.

Who should I contact in order to file a complaint?

Complaints can be directed to Prof Dave Kirk, Director of Open Lab, who can be reached at david.kirk@newcastle.ac.uk.

If you wish to raise a complaint on how your personal data is handled, you can contact the Data Protection Officer who will investigate the matter: rec-man@ncl.ac.uk. If you are not satisfied with their response you can complain to the Information Commissioner's Office (ICO): <https://ico.org.uk/>