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Contents

- * [The downside of using mobile phone signals for data acquisition](#)
- * [Your DAQ Questions Answered: Logging Linear Movement](#)
- * [Data Acquisition News Round-Up](#)

The downside of using mobile phone signals for data acquisition

The city of Enschede, in the Netherlands, wanted to measure how many people moved around their districts. They chose a mobile phone method. But they failed to identify the pitfalls and fell foul of GDPR regulations, gaining a fine of 600000 Euros. Their method of people counting meant that the data they collected could be used to track individuals' movements over time, as well as matching people to a specific phone code at quiet times.



Data Collection via Phone Wi-fi

Sensors in the streets detected Wi-Fi signals from the mobile phones of passers-by. Each phone was registered separately and given a unique code. This makes it possible to measure how crowded the street is by counting how many phones are near a sensor at a particular time. If, however, you monitor over a longer period of time, that counting becomes tracking of individuals.

When it's relatively quiet, you can see exactly which person belongs with which code. Or you can look at patterns: if a person arrives at the same location every day at 08.00, and leaves again at 17.00, that means they work there.

The use of Wi-Fi tracking from mobile phones is subject to strict conditions, and in most cases it is prohibited.

How to identify people from their phones

A person's phone regularly sends a request to nearby networks to see to which it can connect. These probe requests contain data about all the networks the phone has previously found. This means that details of all the physical locations that the person has been to can be accessed. This has the side effect of announcing their presence and trackable identity information to every nearby eavesdropper. Linking this with other data means enables a person's identity, home address, workplace, travel habits and so on to be deciphered.

Each device on a network has a MAC Address - Media Access Control Address. This is a code which uniquely identifies every device. MAC addresses comprise six groups of two hexadecimal digits.

Mobile device manufacturers increasingly deploy MAC address randomisation to try to protect user privacy and the persistent hardware identifiers being tracked. But there are many phones in wide use that do not effectively prevent tracking

Reference and Further Reading

[Why you shouldn't use mobile phone signals to count people: Dutch city fined 600000 Euros](#) Retails Sensing, 2021
[GDPR & Smartphones](#)

Find out More

For more information [get in touch](#).

Your Data Acquisition Questions Answered: Logging Linear Movement

Question

We recently bought some testing equipment that is used to measure the linear movement of concrete samples over time. The issue I'm having is that I don't have any way of gathering the information as I don't have any suitable software that works with the data logger. Just wondering if you have any suitable software that could work with this equipment. All I need to do is gather the readings from the gauges and then I can plot the readings over time and see how the test specimen is moving.



Answer

You can use the Windmill software suite which is free to subscribers. Run the ComDebug program to tell Windmill how to communicate with your equipment. Once you've saved your settings - com port, baud rate, any commands needed, etc - close ComDebug and run the Windmill Logger program. This will regularly log data and the files can be imported into Excel or other analysis software.

For more details see [Getting started with ComDebug](#) and [Versatile Logging Software](#)

If you would like a copy of all the Windmill programs, please email monitor@windmillsoft.com.

DAQ News Round-up

Welcome to our round-up of the data acquisition and control news. If you would like to receive more timely DAQ news updates then follow us on [Twitter](#) - [@DataAcquisition](#) - or grab our [rss feed](#).

"Wearable" plant patch sensor monitors crop disease

Researchers have developed a patch that plants can "wear" to monitor for plant diseases or other stresses, such as crop damage or extreme heat.

Source: NC State University

<https://news.ncsu.edu/>

Remote sensing tackles modern slavery in Greek strawberry fields

A team led by the University of Nottingham has used remote sensing satellite technology to assist the Greek government to tackle a humanitarian crisis unfolding in the strawberry fields of southern Greece.

Source: University of Nottingham

<https://www.nottingham.ac.uk/>

Touch screen could double as pollution sensor

The touchscreen technology used in billions of smartphones and tablets could also be used as a powerful sensor, comparable to lab-based equipment, without the need for any modifications.

Source: University of Cambridge

<https://www.cam.ac.uk/>

Bridge vibrations could be used to improve safety

Unused energy trapped within bridges is to be harvested.

Source: Heriot-Watt University

<https://www.hw.ac.uk/>

Solar radio signals could monitor melting ice sheets

A new method for seeing through ice sheets using radio signals from the sun could enable cheap, low-power and widespread monitoring of ice sheet evolution and contribution to sea-level rise.

Source: Stanford University

<https://news.stanford.edu/>

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