Week 2

**Researcher 1** 00:14

So it hasn't got as hot up in Scotland then [Researcher 3]?

**Researcher 3** 00:20

It did at the weekend. But not these two days it's like 22, 23. There's there's a bit of a breeze. Well, there's more than that a breeze there's a wind blowing down the Forth. So it's very, very pleasant. I'll tell you that much.

**Researcher 1** 00:38

Sounds good.

**Researcher 3** 00:42

I mean, which is good, because I had so much work to do. I'm looking at looking at the sea going. Too much work. Focus. [P1] I live right next to the sea in Scotland, if I didn't say that last week. So I started my job at Newcastle two years ago during the pandemic and I've never quite managed to move down because of family commitments. So yeah.

**P1** 01:08

I was speaking to someone earlier. No was yesterday. And she was in the Dove Marine Lab. I don't know if you know where that... Cullercoats. So that's right there on on the beach. And she because it was a warm Of course, the whole of England was out on the beach. And she and she said it was just not nice working inside when you see all these people outside in the sun on the beach.

**Researcher 3** 01:39

I can imagine that. I bet it's been manic on the beaches there, actually.

**P1** 01:44

Yeah, yes, she did she did say she she prefers quiet beaches, which I can empathise with. I don't like crowded places at all.

**P1** 02:00

Oh, no.

**P1** 02:09

See if I can.

**Researcher 1** 02:12

Maybe we make a start, then, oh oh, well that was good timing, wasn't it? Hi [P3]. I don't know. Can anyone else hear? I couldn't hear that.

**Researcher 3** 02:26

Hi [P3]. Sorry. I think the volume wasn't coming out on my laptop anyway. But it doesn't say you're muted.

**Researcher 1** 02:34

Yeah.

**Researcher 3** 02:51

Don't worry. Is that zoom settings and?

**P3** 03:09

Okay, I need

**Researcher 1** 03:11

Oh, that's better.

**Researcher 3** 03:12

Perfect.

**Researcher 1** 03:13

All right. Hello, good evening. I think this everyone we're expecting because [P2], [P2] emailed a little bit earlier to say that he wasn't going to be able to make it. So yeah, welcome. Hi [P3], thanks for joining us. We'll do some quick introductions, because you've you've met me and [Researcher 2], obviously. We've also got [P1], who's one of our participants. She's got a data probe as well. And [Researcher 3] is our colleague from Northumbria who's the kind of third part of the project team who you won't have met before.

**Researcher 3** 03:53

Nice to meet you [P3].

**P3** 03:55

Sorry, I am facing some problems, with me I hope you people able to listen to me?

**Researcher 1** 04:01

Yeah, I can hear you. Yeah.

**P3** 04:03

Thank you.

**Researcher 1** 04:04

Can you hear us? Okay.

**P3** 04:06

Yeah, I can hear also as well.

**Researcher 1** 04:08

Okay, great. And just so you know, you probably got a notification when you joined the call, but we are we're recording. We'll scrap it records the video but I don't think we can stop it doing that. We're going to scrap the video. But we'll just keep the audio recording and the transcripts and use that for our for our data. Right. Well, hopefully, I know we had some teething problems. But I think hopefully we're sort of starting to get some access to the data now. I know you've only just got yours as of this morning [P3]. [P1] did you get yours working? I sort of saw some emails flying about that maybe you were still having problems.

**P1** 04:53

Well, the Data Probe is working and it's collecting data but I still have the problem and yes to your question, [Researcher 2], you asked if I copied the index across. And I did do that. I followed the instructions, hopefully step by step. And but I still couldn't, the access point only became available for a short while in which I was able to load the page, which was still empty, there was no data on it. And, and then the data access point disappeared. And I couldn't assign get it on my phone. So I thought, Well, when I was at yours, when I collected my data probe, my phone connected, but it wouldn't connect this time. Well, I couldn't see the access point. So then maybe by that time, it disappeared. But then I did try and reset it again. I just did. I had no luck with that. So I have just been copying the data off the memory stick.

**Researcher 2** 06:04

One thing you could try, I mean it sounds like I might need to have a look, because we were trying to do the remote update, right? If you there's a file in the boot directory. The boot directory called conf, a no sorry, called. Is it called conf? Anyway, there's one file in the boot directory and that file has is JSON. And it's got both some information about the battery, but also about the network name and password. In the previous version of the software, before I fixed it, it was possible that the system overwrote its the network name and the password. And just that that information is not in that file. In that case, it won't create the network properly.

**P1** 07:02

I'll have a look right now

**Researcher 1** 07:08

Might be easiest, I guess if if you two connect, especially with you just been over the road to the building. Yes, probably easier

**P1** 07:16

I'm coming tomorrow. So I can let you know or I'll pop over in the morning. We've got like a meeting thing. It's just where's the config file meant to be?

**Researcher 2** 07:37

In the boot directory

**P1** 07:41

There's nothing in the boot directory.

**Researcher 2** 07:46

Okay.

**Researcher 1** 07:49

Maybe that gives us the starting point.

**Researcher 2** 07:53

Okay.

**Researcher 1** 07:54

Yeah, we can check that out tomorrow. So I suppose as well, [P3], I should just tell you that like last week, we, well we didn't have access to the data, but we just had a bit of a conversation with [P1] and one of the other participants and, and just started by getting them to maybe introduce themselves a little bit and talk about why they were interested in the project and maybe about what their their existing experience with kind of connected technologies and IoT and things like that was so I'm going to be wanted to just quickly introduce yourself.

**P1** 08:35

Your sound has disappeared again.

**P3** 08:36

Sorry. So I am facing some problems my side. So basically, I am [P3]. And I am doing my PhD here in Newcastle University. And yes, it is. This is my first year of PhD. As far as my experience related to technology or Internet of Things is concern. I don't have any such experience. I mean, definitely I'm using smart devices like mobile, laptop and other stuff. But as far as specifically, you know, technical terminology of this Internet of Things, I don't have that sort of knowledge or awareness. But yes, I was very interested in this because these are the things which are becoming more common now. So we should know that what's basically the purpose and what's happening behind these technologies and what sort of data they are generating, and how we can use those those data. So that's what I you know, make me sort of enthusiasts enthusiastic about these projects. And then I just, you know, get connected with [Researcher 1] and [Researcher 2] and thankfully, they just, you know, guide me for this project. Thank you.

**Researcher 1** 09:48

No, thank you. Participants. So all the research we do sort of relies on participants and people volunteering, so thanks a lot for taking part. How have you found you've had your probe for a while now, I guess, and I know you'd been travelling a little bit, how have you found the experience of taking that with you?

**P3** 10:16

In terms of probe, I mean, it's fine. Even I have gone like out of Newcastle city as well. During the last week, yes. So in terms of, like, portability, it's fine. I can keep it in my bag, that's fine. But yes, I am little bit reserved, when I am. I mean, getting into a public place or sort of, you know, making it like, like be really available for the others. So I will be limited reserve because they can see, and they can question that. Okay, what is this? And why are you placing it here? So that's why most of the time I keep it in my bag. So in that context, I mean, yes, there is a problem with a light sensor. Definitely. If it is, it isn't my bag, I cannot get any information on light but still I meant it is very useful because it can collect the rest of the data. So in that way, yeah, it's quite helpful. Yes, there is one problem, like I have already told that and you also know that this is GPS problem. So I am unable to you know, record GPS data. That's fine.

**Researcher 2** 11:35

Yeah, we had a really interesting conversation earlier didn't we about like to what extent you would, would have appreciated a bit more detail in the handbook and some of the ways that we could describe, whilst the well I'm putting words in your mouth here, so please, please, please correct me but like, the idea of like, how, I think you could you were sort of asking for opportunities to get a little bit more guidance about what some of the visualisation meant in on the screen, what frequencies were in the audio, that kind of thing.

**P3** 12:17

Actually, I am facing some problem in my again, this, you know, on my on my speaker, so I just, I am able to convert it again to my laptop, basically, I have connected my bigger screen so that's why I am facing some problem. So if you don't mind, can you please just little bit remind, repeat your question again?

**Researcher 2** 12:40

Yeah, sorry. It was long and rambling question

**P3** 12:43

Yeah, just to get us some a small piece

**Researcher 2** 12:45

The visualisation and how to interpret it, you will you are asking about how what frequencies will might be involved. And I thought it was a really interesting comment about how we go from this way of visualising all this information in one screen, and give people the opportunity to maybe open up some of the detail about what the actual way the device process like the movement was.

**P3** 13:14

Okay. I mean, if you allow me, I have compiled a little bit data. If you it is okay, then I can share my screen, I can show you what I have compiled. Otherwise, I can just speak like that.

**Researcher 2** 13:26

It's totally up to you. I mean, like, the way that we've designed this project is, we don't particularly want to see your data.

**P3** 13:35

Okay.

**Researcher 1** 13:37

I think it's more that we didn't want to have the data, we didn't want to store it for sort of legal reasons. So like, if you want to, if you want to show us some of it, I think that's fine.

**P3** 13:47

this is not sort of very, you know, sort of private thing, its something which we can see on on mobile as well mobile screen as well. So similarly, the same thing, I just, you know, develop sort of graph graphical interface for a bigger screen. So that's what I mean, it will help other you know, participants as well to understand data, if you allow

**Researcher 2** 13:47

Brilliant. Okay.

**P3** 13:51

Then I would like to share screen. So just take a minute, please.

**Researcher 1** 14:02

Just just before you do that, I'll just say hello to [P4], and thanks for joining us. So [P4] is obviously one of our other participants. We've got [P1] and [P3] here who were sort of to the participants, and also [Researcher 3], who you won't have met who's the third part of the project team, so he's the our collaborator from Northumbria

**P3** 14:40

Okay. Thank you. Thank you very much.

**Researcher 3** 14:43

Good to meet you all. Good to meet you [P4] as well, welcome.

**P3** 14:48

So I hope you you can see my screen now.

**Researcher 1** 14:53

Yeah.

**P3** 14:56

So basically, this is the 24 hour data for the 11th of July, is like, from midnight to next midnight, like 12am to the 12am next next 12am. So is the 24 hour data is sunlight, so you can see sort of some, some sort of pattern in the light. But yes, I can see this on the screen as well, but there are those, that would be not a collective screen, that would be sort of, you know, in the form of chunks, like chunk off every, like one hour maybe and if you if we can expand it further, then it would be like five minutes chunk or 10 minutes chunk, I don't understand the timing, but yes, I can see sort of pattern. So, I can see that, at what time what was the highest level of the of the light, and after that, how it goes. So I can understand that when it was in bag, and there was a very low light when it was in room. So it was sort of at times there was light in the room. So light level was high. And other time it was you know, light was off and we did not get I did not get any light data. So if sort of light information which I can get, I don't know, what is what what is the unit of this light, but I can just see the values and I only base the values, I can see that where is the highest value and we are the lowest value. So similarly, I have sort of sound sensor. So I can also see that it's a sort of level of sound or noise or whatever you can see. But I still I don't have any idea whether it's sort of I mean, intensity of the sound or is it is it just the frequency of the sound. So, I don't have any idea about it, it may be in it, it looks like it should be like in megahertz or gigahertz or it should be frequency that at what specific moment what sort of frequency sensor captured. So, again, I can find that there are a few chunks where there was sort of huge high frequency you know, highs of the sound and other side which was sort of constant at lower scales. So, this is again sort of information, but I can't see any pattern right now.

**P3** 17:28

So, this is sort of wireless sensor. So I can I can do this okay, this this sort of information is not available on the mobile you sort of I think I have developed from the data from the memory card. So, I can see that what sort of you know, Wi Fi was able to you know, connect or I was able to find and what was the most frequent network which I was using in 24 hours. So, that sort of frequency of of the of the usage or the availability of a network Wi Fi network. So okay, these these are the three things which I have just analysed from the my first data card data and yes, on a personal basis, I can understand that why what what sort of Wi Fi am using most and why am I using that most? And even though location information is not there. So if it is there is a location information along with it, then I can definitely see that okay, at that location, I connected with that Wi Fi at that location, I was connected with that Wi Fi. So these are these are the some some some things which I was able to, you know, process or see. Thank you.

**Researcher 1** 18:46

That's awesome. Yeah, we kind of, yeah, we were really interested to see what like if anyone's sort of access to data and what you might do with it. So it's really interesting. Was there anything in there that surprised you?

**P3** 19:06

I don't think there is any surprise for me basically, because as per the routine which I am doing, I have sort of already in my mind that what sort of thing I am doing and where what sort of light would be there what sort of noise would be there. So I was you know, it would have been more helpful for me if I am doing this sort of analysis or I am looking for this data. For example, if there is sort of light information if I know if I could know that unit of the light versus unit. It's most probably it would be intensity, but still it can be frequency as well. I don't have any idea about the light sensor. It can help me that okay, but sort of was it sunlight when I was going somewhere or was it sort of artificial light or a bug light inside the room, which which was you know, capturing, which was captured by this, this sensor. Similarly, in terms of frequency of this, we call it sound frequency, again, it would help me if we can have like, a manual on manual, we can have sort of a unit of frequency, and then definitely we can understand, okay, if we have like, five gigahertz or two gigahertz frequency, then I can try to identify, Okay, what what what sort of, like, feature can have that sort of frequency, maybe it's a human, maybe it's a bus somewhere, maybe it's sort of some train passing, passing by, then I can find some sort of pattern, okay, if, at this specific time, if this this frequency, then what can be what can be the object, which is creating that frequency for for for them or for the sound that can be helpful as well. In terms of Wi Fi, I've heard some ideas, like instead of currently sensing what sensor is doing, it's just taking one network. So for me, I mean, okay, it is, but I perceive that it would have been taking that the most, you know, strongest signals network. So what I would like, instead of having sort of more strong signal one network it should have, it should collect all the available internet, Wi Fi available in number of counts, maybe like I am in an area, maybe there are five internet, Internet services, maybe six, seven Internet services. So it will help me to you know, identify, Okay, which area has a more services and which area less services? Or sort of location based you know, an answer, it will help me to, you know, understand that, okay, this, this area has a lot of good services regarding Wi Fi and other stuff, other stuff. So there's, there's something and in terms of movement, I don't have I mean, very good idea of the movement I because on the screen on mobile, and I can only see sort of cycle sinusoidal wave. So I don't know how it can you know, relate with the movement. I mean, in terms of movement, it is only you know, moving like this, or it is also kept capturing towards forward movement as well. So, yes, I am unable to interpret that, because it's only either a plane, a straight line, or a sinusoidal line. I don't understand that. What does it mean.

**Researcher 2** 22:37

A lot of technical questions there that I can absolutely help you out. This is, yeah, this is fascinating. Like, I don't think we were quite anticipating you would engage with it. So technically, what are you doing? What are you have you written a programme to interpret the data then?

**P3** 23:09

Sorry?

**Researcher 2** 23:10

Have you used some computer, what what have you how have you done the analysis? What have used some computer code?

**P3** 23:17

No, nothing, just I use Excel, Microsoft Excel. I just use Excel. And I just converted that data using Excel, just refine, I just, I have, I'm using the geospatial I mean, I have geospatial background. So you can see me that use spatial analyst. So I have been using the sort of things in my past, in my when I was doing sort of job. So data cleaning is sort of my primary job, which I have done. So that's why it was not difficult for me to extract information from raw data. So I was able to extract it. So sorry for the other participants, if I am doing something very different.

**Researcher 1** 23:56

I was wondering if we could bring [P4] or [P1] in and sort of maybe as a following on from that about how you'd found the data and sort of whether you've been able to see sort of evidence of what you were doing in there or whether there was anything in the data that surprised either of you.

**P4** 24:19

I'm not I'm not sure anything surprised me. But it was interesting just with I guess knowing where I've been and what I've been doing, somebody else with probably limited knowledge would be able to pick out where I've been in what, what times I've travelled and how I've travelled. I'll pick up the point about a bit more information on the sound that we get, because I think you mentioned that there was done in frequency. So one would be conversation frequency and one will be sort of, I don't know bus or whatever it will be. But yeah, just so I could understand that a bit more because at the minute it's just a there is some sound and there isn't some sound

**P1** 25:02

Yeah, my was you're ready I can show you the, RStudio Shiny app that we've been working on.

**Researcher 1** 25:14

Yeah

**P1** 25:16

Okay, so I just have to share my screen also, I think we probably found pretty much similar things to where is my Oh, sorry, I'm on the wrong computer

**P1** 25:42

sorry

**P1** 25:59

What do you guys see?

**Researcher 1** 26:00

I can see a webpage says datavis and there's a graph.

**P1** 26:07

Yeah, that's it okay. So this is the R Shiny app that [my son] has been writing. So he I think I gave him about four or five files. Now. Yeah, this was also one of the first things he asked me what is the unit for light? And as far as I remember, the light sensors just gives you a value from zero to 256. Is that right? So just the light intensity?

**Researcher 2** 26:36

That's right. I could tell you what the actual sensor was and you could you could work from there to

**P1** 26:42

Conversion. All right, okay.

**Researcher 2** 26:45

Luminosity value. But like, in terms of what we're seeing, it's it's yeah.

**P1** 26:50

Yeah. So this was the first few days when it was pretty much mostly on my desk, and then it was in my bag to go to the go to uni, which is probably these darker bits and so on. And then over here, zoom in a bit. We've got the movement, you can see I'm not very what's the word mobile, I just sit and work behind the computer. What I thought was interesting was this wireless bit. And so this is TalkTalk, which is my home network. And you can see here must have been well I well that is where I travelled to work on the bus. And if I say show all, if I select all of them, then you can see this is the bit where I travelled to work. And I picked up all these other access points. And what what was interesting to me is, I have never been very lucky with getting Internet access on the bus. So I wanted to ask you if I go to Go North East, because that's what I'm seeing. So I guess this was in the morning, and this was in the evening, when I went back. Um, but is this the Is this the strength of the signal? [Researcher 2]?

**P1** 26:51

Yes. Is that the RSSI value? Yes, it is. Yes. Yes. Yeah. So it's, um, where you have to read it the other way around. So the top values here or the are the least strong, and the bottom values, the minus these minus seven. Oh, sorry. Sorry. Sorry, I wasn't reading this correctly. Other way round. But sorry. Yeah. So you got minus? Oh, yeah. Okay. Sorry. Yeah. So the strong values at the top of the graph and the weaker values are at the bottom of the graphs you, yeah I got confused.

**P1** 29:06

Is it right? This the values at the top.

**Researcher 2** 29:09

The minus 60 is a really good signal, but the minus 80 you've got here is a really bad signal. So I wonder if you were upstairs on the bus near the near the aerial on one occasion and downstairs on the bus far from the aerial on the other occasion or something like that.

**P1** 29:28

It could be I can't remember now, but yeah, it might have been in the afternoon that I just I usually when I'm on my own on the bus, and I'm lazy to go upstairs. That could have been that. Although that would have been this one where it's weaker, isn't it?

**Researcher 2** 29:45

Yeah. Yeah. I don't know where the arrow is. But you know.

**P1** 29:51

What is interesting is that it's up and down. I wonder if that's why the phone doesn't want to connect properly.

**Researcher 2** 29:57

It's a very noisy signal. So I don't actually show it. So in the phone interface that you've got it's showing the the highest value, strongest network.

**Researcher 1** 30:12

I was fascinated by that big tangle of different Wi Fi networks during your commute. I thought that would look really interesting. Is it intelligible at all, you know, just can you see? I don't know, can you see your journey? Or is it just a mash of things?

**P1** 30:31

I can literally see where I where I got on the bus and when I got off, because this area here the screen where the green is, I think the green is, is Go North East? Yeah, Go North East is one of these green ones. So. But also when I looked at just at TalkTalk, and then I switched to this, I could see that's where I went to. So what's interesting is if I now go to GPS, I can see my trip on there.

**Researcher 2** 31:03

So your GPS is working?

**P1** 31:08

Yeah.

**Researcher 2** 31:09

Fabulous.

**P1** 31:10

Well, definitely. Because that is the bus, the way the bus goes is, is this route. So it seems to be working?

**Researcher 2** 31:24

Good. And I Yeah, really good. I know that it doesn't update as quite as frequently as, as you might experience on the phone. But I also know that if you persist and leave it, like to get a lock, it will eventually lock. So it's really good, good news to Good News that it's working for you.

**P1** 31:47

Yeah, and then the other one was just sound, which I haven't really made much sense of yet.

**Researcher 2** 31:56

If anybody makes sense of the sound, I will present some kind of prize because it's a very strange way in which I'm recording this information. I'm very, very happy to share it with you. But I'll need to, I'll need to write it down. It's it's not it's trying to record in one number, a series of frequency bands. The presence of frequencies in a number of bands. It's quite a complicated. It's not it's that number is not a frequency in itself. It's a it's a combination of frequencies.

**P1** 32:37

Okay, so basically, so far I've just, well, yeah. [My son] has now asked me Okay, what else do we want to see? And I said, I'll ask you guys

**Researcher 1** 32:55

It's really about what you're interested in seeing actually, and what what we're interested in is what do you make of this data and what you can find in there and you know, whether there's anything in there that is surprising, or whether you can you know, almost tell stories with the data and sort of see evidence of what you've been doing. I did think it's interesting that you've all talked about units and units of measurement. I wonder if anyone had thought about like doing some experimentation actually to see or what different say with the light sensor you know, to see what different intensities of light look like in the data

**P1** 33:39

Well, when I've added the other files for the rest of it, because this only goes up to the 6th, I should have another what six days worth, then it might be interesting to see what the light data looks like then. So the sensor has mostly been here in my study here by the computer and so it's it's an environment that I kind of know what happens what time of day so I should be able to interpret when I see all of that or I might be able to so when I get that I'll maybe next time we can have a look at that and see because like I said when we tried to add the other files the the app bombed out because it was complaining about some, Well, it's it's R so it's fairly cryptic, it'll take some time to to find out what it's saying. Because what it's saying doesn't make sense because the thing that it it says isn't there is there. So, once once I've figured that out I'll tell you what, if I can see something?

**Researcher 1** 35:09

Yeah, that's interesting. You talked about the light in your room, because something we were going to maybe suggest this week as something to try out is maybe exploring your home a little bit using the device, maybe try putting it in different rooms and seeing whether, whether the rooms look different in the data, and whether there's, you know, what, kind of what different ways kind of moving around the house kind of manifests itself? Because I suppose you think of, you know, being in the house as being in the house, but but does you know, does your front room or your bedroom look different? And you know, which of those sensors kind of show you a kind of interesting differences between different rooms, I suppose.

**Researcher 3** 35:53

Yeah, and are there any rooms that are kind of a no go for you immediately, you know, how would you feel or members of your household feel about you putting in the bathroom and leaving you there for 24 hours? And even if you don't, what would that discussion be like for people, if there are other people in your house, either visitors or family members or flatmates or something. I'm really intrigued as that because [P3] when you're talking about, you have it in your bag, but you don't like taking it out. I used it for a week, and I felt exactly the same. And I should know about this stuff. I'm always getting in trouble at airports, for example, with dodgy electronics, different story, [Researcher 1] knows this very personally. But, you know, I'd be interesting. Yeah, I'm really interested in what if other people are in your houses or visit your houses, what they think of it? And do you? I mean, do you have any immediate qualms about putting it in certain rooms?

**P4** 36:50

[Researcher 3], well, people in the house, they're all they're all bought into it they're interested in, I've been looking at the data set quite interesting. And workwise, they're the same, but I've just been on a first aid course today. And it's been in my bag all day. Not quite sure I wanna have that conversation with 20 different people explaining No, it's not recorded anything personal. It's just light and sound. And so that was easier just to leave it in my bag. But it'd be I'd be interested to see if we can tell which room I am in the house, we're which way east west facing. So I think it probably will be able to understand what time of day it is in how how light it is determining which room I'm in. Be interesting if it could tell if I'm upstairs or downstairs. But

**Researcher 2** 37:40

yeah, that's that's fascinating

**P4** 37:41

But then that crossed with sort of, I dunno if it measures strength of Wi Fi signal, probably can. So if you know where my router is you can probably tell which room I'm in.

**Researcher 1** 37:54

Yeah. And yeah, I was really interested by that choice not to bring it out of the bag in the in the first aid training? Probably, yeah, probably feel the same. I've generally taken it well, I've taken it somewhere and it's generally stayed in the bag. Is there any way that you wouldn't take it?

**P4** 38:13

Yeah, airports would have been quite interesting. I know that the start of this study, I suppose, it was delayed a little bit probably for me thankfully. I was supposed to go away for a week. And I would have tried to take it through the airport. But yeah, I can imagine it would have arose quite a few questions.

**Researcher 1** 38:37

It's interesting, interesting I suppose a disparit I suppose of you know, at an airport is a place where you are heavily surveilled. But if you bought a surveillance device, then you know, yeah, suddenly cause problems, I think, which I find quite interesting.

**Researcher 2** 38:57

Like, obviously, there's a kind of immediate, like sense of, oh, this is a strange, well, again, maybe I'm putting words in your mouth, but this the kind of strangeness of the device and therefore the need to describe it to other people who encounter it. Like when you when you reassure them, is there anything that's like, how do you reassure them?

**P4** 39:27

No, I've just described it is the way that you describe it to me it's not even though it's sort of a series of wires and boards and things it still doesn't feel. And I can't quite you can't quite think of the right word, but it it doesn't. It doesn't feel imposed on. Yeah, it's not the right word. But yeah. If it was small, and shiny, and bleeping maybe perhaps that would look a bit more sinister. But it's it's, I guess, the transparent Plastic showing exactly what it is and what's on it and what's around it sort of makes it feel slightly more open and less secretive.

**Researcher 2** 40:09

Yeah, cool. Great. Does anybody else have a similar kind of?

**P3** 40:19

I mean, that's fine in terms of, I mean, exposure, I am able to put it in, in my working lab. So yes, there are other PGRs as well sitting there. So nobody asked me that, what is it? What is that, so I also did not try to explain anyone, so they're just all used to put it on my desk and I just keep doing my work aside. And in terms of, I would like to say something on also there as well basically, you are interface I mean, that we realise this interface is quite quite, you know, interesting. So, even though I am able to do this thing here on my laptop, and I am able to present it here, but still things are not, we cannot see things separately, if we will see separately, you will, you won't, you won't, but any pattern. So if we, if we need to find some pattern, you need to at least check it to gather like light sensor with my sensor, then voice sensor with the with the movement, then then we can understand some sort of pattern, okay, if we are walking, maybe near near, like Metro station, or maybe a park, then you can see that how you are working and how sort of light is changing and how sort of noises changing or sound is changing, there sort of very interesting thing that okay, Parks gives that they're sort of, they're sort of, you know, intact overall. And if you go nearby your train, then you can see that what, what sort of environment of train provides in terms of light and every other thing. So yes, in that in that way. I mean, looking things together can provide us some better, you know, inside of the events, and then we can we can analyse those things that maybe we can come up with sort of very surprising thing.

**Researcher 3** 42:13

I think that's really interesting. I had a question for [P3], do you look at other datasets as is something you do? If you see a data set? Do you kind of think, Oh, I'd love to see what that looks like and do that. Or I'm interested in your motivations for visualising it. And same with you, actually [P1]. You know, I think what you're doing is absolutely wonderful. And I'm just kind of, yeah, it's something you do do a lot or other things. Either of you really.

**P1** 42:54

Yeah, I was just trying to get unmute. Yeah, if you give me data I will analyse. I mean, I'm a Research Software Engineer, you know, so some of the stuff I do is analysing data and I was a bioinformatician. So yes, take all these numbers and make a picture of it, and then try and see what it tells you. So. Yeah, it's something I will do if you give me data, and it's something I kind of do as part of my job, too every now and then. And, yes, I also do, I also do training for ah researchers, basic computing skills for researchers. And that includes using Python and R to visualise data. Because, yeah, as I as I always say to people, nowadays, this almost, well, almost no research will do, there are researchers that don't use either don't have sort of the quantitative analysis as part of the research, but usually they do. And then if they do the data nowadays, there's so much that you can't do it without a computer and when it's that much, also, looking at the numbers doesn't make sense, you'll have to find some way of visualising it or interpreting it. So yeah, there are all kinds of pretty graphs also that you can draw. So it's not just what it tells you sometimes just aesthetic, you know, it makes pretty pictures.

**P4** 44:53

Is it simple to get the data out of, off the machine? Or do you have to take the SD card out?

**P1** 45:07

Yeah I take the SD card out. [P3], is that what you did too? Yeah, yeah, take the SD card out. But your computer can then just read it off the SD card, like any file, any SD card. And then it's just the format is what's called JSON. So you need something that will read that. I didn't know [P3] I find it Interesting, I I'm one of these people that go around telling people not to use Excel. So how did you convert the data? I mean, for me, its not a problem, I'll do it programmatically. But did you do it with Excel? Or did you use something like open refine? Or what did you do?

**P3** 45:55

In that way, I am you know what you can say illiterate even though I used to code, but I used to code only things related to my project. Not everything. Because I am not basically a coder from the beginning. I'm trying to learn Python. Basically, I'm trying to learn Python and working on my PhD project on Python. In terms of this, I don't know it's a JSON or whatever. But I know that I need to find sort of parameters, which are available in data, and I need to clean it. So I use just filters inside the Excel. And I just removed, you know, the things which are not relevant, I just found that but you can say to the parameter name, and then related values, I just cleaned it using filters. And that's it.

**P1** 46:46

I will I need to teach you, you need to go on one of my workshops, using something like open refine, or even the Python workshop. Okay, if I may advertised blatantly.

**P3** 46:58

I am interested. I am interested. Definitely. Yeah, there's something which I really look into, I mean, this programming thing, that coding thing, yeah, definitely, it makes things quite, you know, makes life easier. I know that. But the thing is, I'm last of six or seven years, I'm using Excel based analysis because I was doing sort of industry job. So and everybody was willing to you know only see things in Excel. So that's why I am more, you know, sort of have a good handle on Excel. But definitely I'm switching myself being a true researcher, I would definitely convert myself or from this Excel to sort of Python or R or programming.

**P1** 47:38

I was just working my way through some papers because of a presentation I'm working on and newspapers are about errors in research because of using Excel. So yeah, that's off the topic now. My favourite rant.

**P3** 48:01

I mean, I shouldn't be definitely, sorry, I should be thankful to [Researcher 1] as well. I mean, and [Researcher 2] for being the sort of participant that we are not only talking about this project, but also the related things like programming and other stuff. Thank you very much.

**Researcher 1** 48:16

We'll we'll we'll claim that has impact if anything comes out of these calls. So I think we're sort of heading towards time there. And I know it's it's everyone's personal time and your evening, so don't want to don't want to keep you any longer than then we threatened to. Are there sort of like final thoughts or anything anybody wanted to add before we kind of brought this to a close? All right, good. In that case, thank you for joining us, I guess leave you with with encouragement to experiment. So, you know, if you're unsure what what a sensor is reading and kind of what the value should getting out of it are like, I would encourage you to mess around with it and see, I have a play around and see if you can get to the bottom of that actually. Maybe do explore your home a little bit. I think that would be we figured that'd be a really interesting thing to do is move it around the home and try it in different rooms and see what you see and see if you can see stories in the data. I want to leave you with is just as in the last few minutes, my phones buzzed a couple of times that an unknown device is connected to my Wi Fi network. I'm pretty sure that what that means is that my girlfriend's cousin has arrived to pick up his blender that he left at the weekend and it's just I didn't get a lot of data just got just got two pings saying the unknown devices are connected to the Wi Fi network. I thought like that happening during this call I thought was quite interesting.

**Researcher 2** 49:56

Brilliant

**P1** 49:57

What did you use to get that ping from what have

**Researcher 1** 50:01

I've got these TP Link Deco routers that has an app and it tells you when something connects to your to your network. Yeah.

**P1** 50:09

All right.

**Researcher 2** 50:11

All right, brilliant. Thanks a lot. I'll hopefully see you next week. Don't hesitate to get in touch if you have any technical problems or anything. Because we're we are still running around sort of doing little bits of fixes and I maybe [P1] it sounds like we've got maybe a quick fix to do on your device to do yeah, do get in touch. Because we can we can do that stuff quite easily.