**12040**

**VR**

12040: So there's no tutorial, I just explore and figure out how this works.

Conductor: Yes, you can just kind of explore the workflow now, move around and then maybe tell me what you see and about how you find things.

12040: I know. Are you start you start recording and you let me know.

Conductor: So now yeah, I have. I have. Right. OK.

12040: And yeah, so basically I see this Rainbow road. And then if I zoom in a bit. So I guess the first step, its lost... ehmmm how do I move forward?

Conductor: You can … with the right joystick? So you point it forward, with the left one you can turn..

12040: The left one I can turn.

Conductor: This this one.

12040: Aahhh right, it's turning. I see applications BBS.

Conductor: OK. perfect

12040: Removal of genome contaminations. Perfect. Feels like home nice and yeah, first preprocessing.

Conductor: That's the first stage.

12040: Ehmmm but then how do I? I'm now moving through the preprocessing but I can’t land on a note. Can I zoom in a bit more? Yeah.

Conductor: You can't really zoom in. You can only like turn towards the panels which hold the information.

12040: Where is Pane. Ah the panel is this horizontal space.

Conductor: And the panel, usually with the panel, I mean like where it tells you the applications those information panels.

12040: I can sort of like fish out on each node. And yeah, so now there's like this curve that's landing on one of the node. Yeah. And how do I select it?

Conductor: And then when you release the joystick you'll land on that node.

12040: ahh I see an arrow pointing at me.

Conductor: OK, yeah. Then that means you're on an input node.

12040: Now I see it OK input node files. Fast Q contains the RNA sequence sample sheet in a table format. Ehh Yes. And then?

Conductor: And then you can move towards the next node which will be like the next application the data go through.

12040: But then how do I input the data?

Conductor: There isn't really any functionality. Is only.

12040: How does it work though? There's no but then in reality, if I want to now input the data. I can look down and click on this.

Conductor: That would maybe be a functionality that could be implemented, but this is just like for visualising it first. You know?

12040: Yes, OK, good. And then now I can jump on the next note. Ehhh Applications. Cache fast queue. To Merge re sequence fastq files. Yes. So now you can concatenate and then the next one is using salmon to sub sampling and pseudo alignment to infer strandedness. Yeah. So first of all, some suggestions.

Conductor: Yes.

12040: So when I'm actually because this whole, now if I'm jumping through the nodes, it's just it's this rainbow. And then because each node is just like this white dot. So I cannot really see so it would be great. If so, after I jump I'm facing. I'm still facing this pipeline and I can't really. I have to turn around to see the. I can just look at. It's OK.Yes.

Conductor: You can also just turn. I'm sorry, I should have told you.

12040: That makes more sense. Maybe it's better I stand up.

Conductor: Okey yeah Yeah, yesterday I forgot to tell that it could turn with the joysticks, and he was annoyed that he also always had. Turn so. You can do both.

12040: Yes, OK. Now, so now I step here.

Conductor: Yes.

12040: And then I'm jumping one step further up and down. OK. But if I'm standing up also this application is somehow zooming like Disappearing.

Conductor: Oh, that's because you maybe left. Maybe just move a step forward. Is that better? Yeah, actually. OK. Yeah. Because the, like, glasses always use this boundary which you can move in.

12040: I see. Uh, yeah. And then, but then now it's better. But then still if I jump forward, it's like the whole space move a bit closer to me. Yeah. But then if I don't turn around, it's kind of hard to tell like, OK I Already jumped one step forward. For so will be better if you know you number these.

Conductor: OK.

12040: Somehow not just all look the same. And then applications. Fast QC to reach QC. And then so because now you have applications. Cache fast Q it somehow because fast Q is a data type OK and it's not really application. OK, it would better if you have like input output applications and then what this step is doing? OK, OK, you know.

Conductor: Yeah, it's good to know because I don't have so much knowledge about the workflows. Yeah, I just copied how it looked. Yeah, originally.

12040: I see that makes sense, yeah. Applications fast key. For read QC.

Conductor: Umm, OK. Are you doing fine with motion sickness? Are you sick at all?

12040: It's a little bit odd when I , but I think now it's a bit better, but then you know it can't really. If I look really far to the end of the workflow, yeah, everything is a bit glitching. OK, because the lines are like shaking a bit and then if you stare at it for too long, then it's a bit annoying. Applications umi tool so now I'm encountering a term that I don't really understand. OK for example this UMI tool. It'll be great since they're so interactive already f I can point at this term. And then it shows me what it is, yes? Something like this? Yeah, that would be great. Next one. Adept and quality trimming. Yeah, so this I understand. Like this trim galore was the explanation. Yeah. So I understand what it does. It does adapt and quality trimming, so it will be great if you know you have like a link. Also if I just click on it like this, I don't know what they actually do. So if I can like if you link this to their GitHub page. Yeah, something like this. Would be also very nice. And fastP also just a word and it doesn't. And then now it looks like this one. This is like a alternative step. No? This fastP, so it's it would be nice if you say this is alternative. I suppose it's an alternative trimming Technology or whatever, and then there's not so much information about it.

And then quality control. The control. In removal genome contamination, this is BB-split. This is the core of the workflow I suppose and this is the most important functionality. because everything else was mostly just quality trimming, quality control and then now you're starting to remove all the contaminations. haha. I can see you.

Conductor: Maybe it just move a bit far. Yeah. Exactly. Sometimes you can move out of this space. Hahaha “I can see you” . You aren't supposed to see him

12040: And and then to next one. What's this one? Is a black Node what does it do? There's nothing here. Do you know what I'm talking about?

Conductor: Ehmm no…

12040: So this is now I'm at this sort me RNA OK removal RNA and then if I keep going there's like different paths I can go. Yeah. But then there's one black node that's sticking out on the side.

Conductor: OK. OK. Can you move on to it? Maybe.

12040: I'm now on to it. Oh, there's nothing, OK. So I'm not a bit confused. It's just a black node sticking out.

Conductor: OK, maybe I'll Take look at that one.

12040: Next one this is a white node also with no information.

Conductor: In which state? Sorry, are you right now?

12040: I'm now on the second genome alignment and quantification. And then I have four ways I can go, right. And then these four ways. It's just white dots, I suppose. Maybe just to distinguish which way I'm. To go. But then it's just a white dot in the middle.

Conductor: The middle. OK. Yeah, it that could be the case. But I might also have to take a look at that, but it isn't really an issue. Maybe just keep going in. Stage and then.

12040: Shut. And yeah, so now I have to take a path. It's like it's like in a puzzle that you have to decide where to go, but then there's no roads signs!

Conductor: OK.

12040: So let's see if I go here. I'll just a dot. And then now I'm on the blue paths I don't know. There is no information now, it just the big the signs post processing there's there's pseudo alignment and quantification. There's final QC, but then that's the only sign.

Conductor: You see only the stage. OK then maybe something went wrong with the application because there should actually be the normal information panels.

12040: I can see. From afar but then when I Actually, jump on the stage I don't see. Now I can see application again Umi based deduplication. See here. I don't know. There's something. Because I can see and some. Yeah, some. Some of these and OK, these. Green boxes are missing.

Conductor: Yeah. OK. Maybe it's because of like the. Maybe we could just restart the application if you want to. Yeah, let's check it out.

12040: So I think only because you know now you have blue. Green, yellow, pink, purple and. And that on the blue-green. Yes. Some of these signs are missing. OK. And then yellow now has one. Pink has one. Purple also doesn't. Yes. OK, let's restart and check if that.

Conductor: Yeah, maybe. Can I just maybe take a look at how it's looking right now? OK. If you see anything. I do really get motion sick I don't know how you did it. This is so bad for me, but I feel like that's also why. Like sitting down, I think I do see the signs. Maybe when standing on an application, try not moving around so much, you know. Yeah. OK, so. Yeah, but I feel like right now. Oh, I see. I see. I see. Now I understand, OK. They kind of OK, they disappear. That's the problem. Yeah. OK.

I don't know why though. I'll just restart it real quick.

12040: You see the black node that has nothing.

Conductor: It actually does. I don't know why. Maybe. I don't know why they disappeared right now, but may right now it doesn't really seem to do that so. Maybe it works now. It seems to be working now. OK. I'm just giving you. But like, try standing right there. Because for like, the movement in the application, I only chose to do teleportation, so maybe that's why it like kind of does some weird things when you also move in reality, you know, OK. Because. Umm yeah, it isn't really meant for the application, but can you see the panels?

12040: What does the curve not curving?

Conductor: Can you see the controller in the application? Both of them.

12040: But so this controller shoots out. The And this beam was sort of landing on the notes. Now it's not landing on the note.

Conductor: Try it with this with. Right. One maybe when you do it with. Right. One the joystick. Right here. Is it doing something?

12040: OK, So what are what are these big yellow arrows?

Conductor: Those usually try to represent if a node is input or output. So if it's pointing to you it's like supposed to be input at this node, and If it points away from you its supposed to be output.

12040: OK, I think that's not very clear. If I just if I get any introduction, if you just put on the arrow, it says output that's much better.

Conductor: I think at one node I kind of also like accidentally have a point like have an arrow pointing towards you, but it says output on the information panel. That was my mistake. But at the other ones it should be should be correct.

12040: I'm just moving forward, so after Samtools now, there's Picard Mark duplicated. And then I'm just picking I just picked a path I picked the blue path and move forward, yes.

Conductor: have you kind of understood the point of the past already or.

12040: Yes, I think this is rather clear. Now. Have boxes and then these boxes are modules and then for each modulus you have first preprocessing the second module for genome alignment qualification. But I did not realize I've already entered post processing. Because obviously everything is numbered. So after Geneome alignment quantification I was Supposed to enter the third Module. But because the blue Path is going directly to post processing. I need some time to understand what this workflow is doing.

Conductor: OK.

12040: But. And so now anyways, now I'm in post processing. And it's a bit challenging to jump so far. It stops fishing at some point. If I want to fish all the way back to, let's say, a random node in two, I could reach so.

Conductor: Try doing. Or maybe sometimes you also just have to go along the notes to move back.

12040: And it's sometimes a bit annoying if I have to, because sometimes the panel the information panel shows up at this direction and then sometimes it shows up.

Conductor: Yes. Yeah.

12040: 180° away from it.

Conductor: OK.

12040: So I have to like keep turning this way and this way, but that's just yeah and OK, anyways now I'm at coverage.

Conductor: Maybe to kind of make it clear, these third stage is just an alternative way for the data to go.

12040: Let me try to jump there actually. Then I wouldn't really number it you know I wouldn't. I wouldn't number it like as 1234. OK, because it doesn't work like this. I would either just call them main workflow. Sub-workflow or OK? Just colour them also just like how you know because you have these paths that's nicely coloured. And if you're using colour as a visualisation. Then maybe these names can be also matching to the colours of this path. OK, but then I know sometimes it's a bit challenging because you know 1 module contains like 3 paths. 3 colours together. But then, maybe there's a way. To colour matching the names of the modules to the path.

Conductor: OK. Maybe so we have time for the other applications too, yeah.Maybe we could just. Yeah.

12104 But then this is good. Just I'm in the final QC and just check their last final step. Yeah, final output HTML. Yes, but then why is this last path? Yeah. So the last step, the last step is Yellow, green and blue. Yeah. Blue is a bit detouring. So the blue doesn’t take the kraken. Yeah. Why is that? Because now I'm lost it. Now. I don't know what blue does anymore.

Conductor: It's just as far as I've understood. Again, I'm not like really don't have much knowledge on these workloads, but those paths just show different. Like the different paths you can choose when you choose to like use this workflow and then you can say OK I want my data to go along. Maybe this blue path and then people that know what the applications do maybe could be like, OK yeah, I want the data to go through this application or maybe it's unnecessary. You know? So then maybe we choosing. They really, especially the green, blue and yellow one, they don't really differ in much in many applications.

12040: And then what's this note that's going across 2 yellow and green?

Conductor: There's like one large long note, and that one is just because those two paths kind of use the same application at that point.

12040: Let's try the next one.

Conductor: And then you have to go through a couple of questionnaires first, OK.

**Desktop**

Conductor: I don't think this one should take that long.

12040: Yeah, this is. I've never used this specific workflow, but of course I use similar workflows. And then you know, if you just look at this figure, it gives you a much better overview of what you're looking at. And I think in general it's much more information, that you can get from the figure comparing to the VR because in the VR it's really like. Throwing you onto a map with no roadsigns. And then this more like a metro.

Conductor: Yeah. Yes, it does look like that

12040: You know, map it tells you like which stop you're going. And yeah, also here now it's it's clear for me like what these colours mean. Because now it's very clear that the green is aligner blue is aligner but then with a different alignment tool. Yellow, also a different method, but then these are aligners and then pink and purple are pseudo aligners. I think in general, yeah, just looking at this figure is. Gives me more information or gives me more understanding.

Conductor: And would it change anything if you already knew this visualisation and understood the workflow that way, and then went into the VR application? Do you think that would change anything? Or would you still prefer this one and not even use the virtual reality thing?

12040: If I already knew this, maybe I think it's. So for me, VR is like a really nice way to and give people an interactive way OK to sort of experience your workflow. It's like it's it feel like you are a data file and then you're going through a processing step and then you sort of have the choice of choosing which path you want to go. So I think if you keep this in mind and develop the VR, maybe it's a bit better because. If you are a data file yourself and then you're containing all the information and then you sort of going through the transformation through this pipeline and then it would be a bit more interactive than just juming through the nodes

Conductor: OK. OK, nice. So yeah, this is just it. And then we would have the. Interview and questionnaires again for the desktop version.

**AR**

Conductor: OK.

12040: This is nice.

Conductor: And and then how do? Accept this. You exit by looking at your left hand and then a menu bunch pop up exactly have.

12040: I'm gonna click and.

Conductor: You can click exactly by doing just what you did right now by pinching like your index finger and thumb. No, you don't really have to. Maybe you left already no.

12040: Still there. It doesn't because if I pinch then I start to good. But that has.

Conductor: OK, nice.

12040: To turn around and to move away.

Conductor: It's usually just your hand that you have to move because sometimes it kind of uses the raycast still and then it thinks you're trying to grab something.

12040: But that cannot really go click on the red.

Conductor: You can't. That is something I only thought of. That's also what the person yesterday said. That is something you could actually implement and wouldn't even be that hard. Yeah. OK. Perfect. Just to move. The stages that way. Good. OK, nice. Maybe if you've already seen enough, we could jump right to the questionnaire.

12040: Yes, yes, let's do that. Let's do.

Conductor: Just so it doesn't take too long, do.

12040: That let's do that. OK. Nice. That's nice.