

# 悉尼大学 2

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## 关键词

reward function bigger function banner function Figma function wigner function vague function signal function wing function webinar function wignet function rigno function wigner function values new state Good states many states sample treatment function other states

## 文字记录

说话人 1 00:05  
Which is, I think that way I will understand this attribute, understand this. It's SIM, it's similar, but it's just something that will make more sense to downstairs to the type of good thing we have downstairs. This is really good.

说话人 2 00:29  
So AI told me I have something to improve. It's right. They think safe.

说话人 1 00:36  
Right restaurants is required for a much smaller mass commercial recommendations based on the.

说话人 1 01:03  
Okay. Yeah, this so it says something this like measurement based training is interesting. Do you know the difference between measurement based and fidelity? A lot. Okay. Yeah, sorry.

说话人 2 01:26  
The finality of the, yeah, of the experiment. Yeah, I just know it is to use the, I'm not sure that it's okay. To use English to.

说话人 1 01:43  
Describe it. I think, yeah, just try. Cuz, yeah.

说话人 2 01:47  
In experiment, the finality. We need to change the, I think it's also to make to, to, to, to, to change to spread it into smaller and to, and then to change it.

说话人 1 02:15  
So write it in a way so you can, you said smaller.

说话人 2 02:20  
Okay.

说话人 1 02:22  
I guess do you know like, do you know mathematically what fidelity is?

说话人 2 02:27  
AI told me. Okay. But I don't remember that. Yeah, in book, it also I remember it's a long formula.

说话人 1 02:40

I don't know. I think it's not too bad. So I can try and explain fidelity. So if it already, actually, I can write it down. Do you have that book that we were writing down on things? Oh, yeah.

说话人 1 03:09

yesdoor 门。

说话人 2 04:36

i have read the. Chinese edition.

说话人 1 04:39

Good.

说话人 2 04:40

I don't know. I can remember to be honest.

说话人 1 04:45

Sir.

说话人 2 04:54

Do you mean this one? Formula?

说话人 1 04:57

That's complicated though.

说话人 2 04:59

Yeah, I have read it.

说话人 1 05:02

So fidelity.

说话人 1 05:12

So the fidelity, so I say like fidelity us to states. So fidelity of two states. And let's call state 1 Taiwan and beside you. I make sense so far. So the fidelity is equal to say two side one. And I think usually it's squared. So do you know this notation? Yeah, I think, yeah.

说话人 2 06:05

In in the one chapter. Yeah, yeah.

说话人 2 06:23

Do you mean that this is smaller Chapter, Director.

说话人 1 06:28

7?

说话人 2 06:30

Do you mean the inside?

说话人 1 06:34

This means like absolute value square. Sometimes they don't have it like that, but fidelity. So fidelity there.

说话人 2 06:54

So far.

说话人 1 06:55

Yeah, that is in gen. This is the general.

说话人 2 07:01

It's.

说话人 1 07:02

General. But if you wanna think about a simpler version that's not general. It's.

说话人 2 07:08

It's like this. It's this one.

说话人 1 07:11

And then do you can I give you an example? So one example is, so Saiwan is equal to  $0+1$  inside to you is equal to  $0+1$ .

说话人 2 07:52

1. Yeah.

说话人 1 07:56

Okay, so if we're gonna write this formula, say two, sorry, one.

说话人 2 08:29

I remember I have read it. So do I need to 22, remember that? Because I remember that there are some formula to.

说话人 1 08:45

You can always act. Yeah, you can always ask.

说话人 2 08:48

To contact that.

说话人 1 08:50

So you can always ask AI what fidelity means, like what the simple way of asking a fidelity is. But the point, yeah, I guess the point I'm trying to make is that it's the fidelity is kind of like one number. So you can say it's like one way of saying it is how close two states are. Okay, so if you wanna say like, okay, how good is my numerical optimization? How good is my machine learning? And you, you know, it's like, you wanna high fidelity. Yeah, cuz that says that the ideal state is, and the state that you make during the optimization are close. If they're close, it's gonna equal. If they're close, that means your optimization did a better job at doing high fidelity. So the fidelity is like a way of getting a number and it's just getting mathematically this, like mathematically comparing two states and you get a number between 0 and 1.

说话人 2 10:19

Yeah, so higher fat and tissues result more accurate.

说话人 1 10:24

So you know how they say like, so when AI was saying you need measurement based?

说话人 1 10:37

So fidelity isn't measurement based. Do you know what?

说话人 2 10:48

Yeah, it shows most runs, reels, direct fan. I ask the.

说话人 1 10:52

Reward. Yeah, but that's not. If we were running a real experiment, you couldn't do that. In the real experiment, you can't just get the fidelity between two states.

说话人 2 11:11

So in experiment, how to find, how to improve.

说话人 1 11:15

Exactly. So you have to improve the fit. You have to improve the fidelity by making measurement based, measurement based rewards, right?

说话人 2 11:36

But how to get the experiment measurement result?

说话人 1 11:42

That's good question. So if you wanna do a measurement on a quantum, on a state, you have to apply some sort of operation, right? And that operation is something that will tell you something about the state. So one example is, so there is like in, in, in my, in the paper that I wrote. Yeah, these, these, okay. Okay. So every this is these are all this is all experimental data. So each pixel, each square is a different measurement.

说话人 2 13:04

Different measurement.

说话人 1 13:05

Yeah, it's a different measurement. So each time I wanted to measure, when I wanted to get this pattern, I had to apply different operators for each pixel and that, and when I got the whole picture, then I could estimate the fidelity. But you can't estimate the fidelity third time. You can't estimate the fidelity like this. You have to estimate the fidelity by taking measurements of the state and then collecting all the data.

说话人 2 13:41

So to.

说话人 1 13:44

Get the real.

说话人 2 13:44

Fidelity, we need to do.

说话人 1 13:46

Experiments. Experiment, and you have to do many measurements.

说话人 2 13:51

Oh yeah, after do many measurement and get the higher fidelity.

说话人 1 13:55

Yeah, to get the high to get a high fidelity, you need to do more measurements.

说话人 2 13:59

Okay.

说话人 1 14:00

But in the code that you wrote right now, you simply calculate the fidelity. Yeah, but you can't just calculate the fidelity. You have to get the fidelity through measurements. And so the paper that I sent you, the one for me, the VA, Vladimir Sevack paper, which I, which is here.

说话人 2 14:23

This one.

说话人 1 14:25

Yeah, that one. So they, they, this whole paper is about how you do the training without measuring, without calculating fidelity, but instead measuring the states.

说话人 1 14:44

If that makes sense.

说话人 2 14:45

Yeah, I get it to, yeah, I need to. Design a AI agent. Yeah, to find the, to find the to improve fidelity by itself, just simulate in classical.

说话人 1 15:03

Computer. Yes, you have to design AI agent that takes, simulates measurements just like a content computer would and then create states that way. Create states. So you, you have you design an AI agent, which instead of calculating for the fidelity, so you done Mo, you done most of the work already. The AI agent improves the circuit by calculating fidelity. But now we want an AI agent that improves the circuit by doing measurements of a state that makes sense. So right now, your code does this. It just calculates fidelity like this. But this is not how real quantum computers work. Yeah, so the way that real quantum computers work is they calculate states  $s$  like this. So what they're doing is they. So this is, if you want to create a cat state, this is what it look, this is what a quantum computer will tell you a cat state looks like. And what Vladimir Sevack is doing with his paper is he saying, okay, what if the AI agent could only look at the data that comes out of the quantum computer? Not the calculation of the fidelity because it can't, the quantum computer can't do that. But what if it only looks at the data that comes out of the quantum computer? Yeah, kind of improve the circuit that way. And so that's what he's showing is that I think that what this figure is showing is that if you use the fidelity, the epoch is really good.

说话人 2 16:53

But yeah, it's.

说话人 1 16:54

Right. But if you use, so wigno, rigno function, wignet function. Yeah, so wignet function just means, is just a way of saying the data that comes out of the computer. So that would, in the quantum computer, you can get a webinar function. It's much better to get the wing function out of the quantum computer. It's impossible to do the fidelity. We're not impossible. But anyway. And so what he's showing is that if you just take, if you just use, if you get the AI agent to take values of the signal function, how good is it at improving the circuit?

说话人 2 17:33

The fact is more.

说话人 1 17:34

Higher, it's actually lower. So this is the, so this is the, so this means fidelity method. And this is the fidelity of the state. Yeah, so this. Here he's showing, okay, how good is the state numerically? Like how, how good is the state that gets produced if the state is being, if the circuit optimization is done by take, by taking the fidelity, it converges faster.

说话人 1 18:05

Yeah, and really draw high fidelity. If it's done by taking measurements of the vague function, it's slower at converging, but it's still good. And this is if you take 100 points. And then if you only take 10 points, it's slower, but it's okay. Take 1 point, it's

even slower, right? Yeah, but it still converges to a value. That's okay. Yes. So that's what that's what the code.

说话人 1 18:33

So that's what the, what we're trying to do in downstairs is we don't want to have to calculate the fidelity. We wanna try and measure. We wanna, we wanna get, we don't wanna get the fidelity by calculating it, cuz that's impossible. We wanna get the fidelity by measuring the data. And that's what.

说话人 2 18:56

Oh yeah, I get it. Yeah, at now the, to get. The higher fatality, we need to do so many measurements. Yeah, but if we can use the AI Agent to get a good result, we can use AI agent to just use data to measure data.

说话人 1 19:16

Did we? We just get it to measure data.

说话人 2 19:19

And then we don't need to do experiments.

说话人 1 19:22

Oh, I don't know. We still need to do the experiment. We we know that if we do the experiments and we feed in the AI agent real data from the quantum computer, it will work. Oh, so right now we wanna do simulated data. Let's see if it works with simulated data. And then later we can use the quantum computer to get real data.

说话人 2 19:43

Okay, so my task is to decide AI agents to get a higher fatality for Wednesday worth to create states.

说话人 1 20:01

Setting. Yeah, an agent to get a high fidelity for which set.

说话人 2 20:07

We need to prove. Yeah, AI agent is suitable for one states and for all states. Oh, so do we, do I need to prove or just need to decide an AI.

说话人 1 20:22

Agent? You just need to see if it works. You design AI Agent to see if it works. It doesn't have to be just try with one state first. Not to just try it with like, I don't know, but.

说话人 2 20:36

Like cat.

说话人 1 20:38

Yeah, Cascade.

说话人 2 20:52

To be honest, they are so formulas in this paper. I can't understand which ones such like this. It's a little bit long and I can understand it.

说话人 1 21:04

Yeah, but I think so this is so, okay, so you know how I said that fidelity is equal to this. There's other ways of writing fidelity. Actually, there's many different ways of writing fidelity. And so this is, all this is saying is that it's a lot, it's a scary formula, I agree. But it's just saying that there's a way to get a fidelity if you have the Wigner function. Is it? So  $w$ ,  $w$  alpha is being a function. An alpha is a two dimensional vector. So like if I just, so for example, alpha 0,0 is here, alpha 1,0 is here, alpha 2,0 is

here, alpha 50 is here, for example. And it's just saying that the, it's just giving the fidelity with the Figma function, this w alpha. It's just quantum data.

说话人 2 22:11

Yeah, I know that.

说话人 1 22:15

So that's, yeah, that's what this is. Yeah, GKV states as well. So that useful.

说话人 1 22:32

What else?

说话人 2 22:33

So I need to design an AI agent to create to. Chris stays in trapped iron were or in the other.

说话人 1 22:44

You can do this for you can do this you can do like something similar to this for now. So like this is what you have now. You have the control circuit and then after the control sector, you just, you measure the fidelity. So you calculate fidelity, but you can, you can do, you can just change your code so that it does has the same control circuit. But then we now have to use it a robot circuit. And the reward circuit is just gonna be applying similar operators, but then taking measurements.

说话人 2 23:21

So it's equal to, I need to find the code for this paper. I need to design code for this paper, to find their code.

说话人 1 23:33

To get their code. Do they have code?

说话人 2 23:34

No, no public code. Okay.

说话人 1 23:38

Well, yeah, if they did, you need to write. So this code is for superconducting, like this paper is for superconducting. You need to write code for trap diamonds. Yeah, so that we can do it.

说话人 2 23:53

Okay, but I don't know the code.

说话人 1 23:56

It's.

说话人 2 23:56

Okay. I think I need to design a new code for trapped iron.

说话人 1 24:01

Yeah, but they can they tell you how to write it? Oh, if you read the paper.

说话人 2 24:05

I have read the paper, but to be honest, I always forget because there are 2ages. Yeah, I ask AI to translate. Yeah, yeah, to explain the all paper for me. And I have read the. Every paragraph. Yeah, but I can't remember that too. And.

说话人 1 24:30

It's really hard. This is a really hard project.

说话人 2 24:32

Yeah, it's 2ages. Oh, yeah, so I get it. Yeah, I need to for understand, for fully understand for this.

说话人 1 24:42

Paper. Don't have to fully understand like.

说话人 2 24:45

But if I don't fully understand, I don't know the mathematical formula to design the code, maybe I'm not sure about.

说话人 1 24:56

Yeah, I think it would be okay. Like the only really, this is all you need to understand in terms of math. Okay. Like, do you know like I a displacement?

说话人 2 25:11

Yes.

说话人 1 25:12

You know what displacement is? Do you know what a snap gate is?

说话人 2 25:14

Yeah, it's a gate medal. Like.

说话人 1 25:20

Okay.

说话人 2 25:21

Good.

说话人 1 25:21

Sequence. Okay, yeah, exactly. And then, and another displacement, you need to know what this is a measurement. Do you know that? Have you seen measurements before?

说话人 2 25:32

Measurement.

说话人 1 25:32

Before? Like, have you seen like, do you know what, like if you measure something, like if you measure a cubit, do you know what do you know that.

说话人 2 25:43

Looks like this.

说话人 1 25:45

Kind of they. So here, so I guess, so.

说话人 2 25:50

I just know after measurement, the stays well will change.

说话人 1 25:57

Yeah, that's true. It does change.

说话人 2 26:00

So.

说话人 1 26:00

Yeah, so let's maybe talk about, let's label this fit. So this. So we can talk about, we can define all the different things. So d alpha.

说话人 2 26:25

I remember in trapped aisle, one state can have a huge robot space, not like the other states.

说话人 1 26:38

Yes.

说话人 2 26:40

So in trapped iron, the state is more stable. It's more believable.

说话人 1 26:45

Yeah, that's true. Houses, rxn.

说话人 1 27:02

Okay.

说话人 1 27:10

Okay, sir. Here, this, when you draw a quantum circuit. The thing that's important to remember is this is a boson and this is a killer. So how many states are there in a Cuba?

说话人 2 27:27

How many states in Kuwait?

说话人 1 27:30

Just two. Exactly. Yeah, good. So this is just two levels. And how many in a person?

说话人 2 27:39

It's so huge. Weekend. Yeah, weekend.

说话人 1 27:41

Yeah, good. Yeah. Dot Infinite, right? So, you know, the displacement is. You know what is not good is. Well, you don't know it exactly, but you don't need to know it that well. And this is a displacement. And do you know this little sign here means this little.

说话人 2 28:06

Yeah, it means one state.

说话人 1 28:12

Actually means.

说话人 2 28:16

I have. I've seen it before.

说话人 1 28:26

Yes. Nice. I can tell you. So. If I have a unitary operation of unitary operation and then I and then I do I multiply it by unitary operation Dago, it's just means conjugate transfers. I don't know if you've seen that before. Imagine us. Okay, do I. So if I go

unitary operation, kind of good. This just means. Identity.

说话人 2 29:05

Oh, you mean an identity?

说话人 1 29:07

So you just make. Just means nothing. So when you go displacement and then this one, it just means the opposite to the opposite of what you did. So if, yeah, so if I get like, so displacement, this is equal to a negative displacement this across. Okay, okay. I know that's on. I just wanna define different things. So is this is a displacement snap gate obviously displacement. This is a measurement. Okay? What happens when you measure a state? If you measure a keyboard, what happens?

说话人 1 30:04

Cuz I mean, it will, yeah, collapse. Yeah, yeah, yeah. Okay. Yeah, exactly. So if I measure this. I get the outcomes either 0 or 1. And also, this is a cute thing and it also tells me if I wanna do a measurement, I can also know the percentage. So like if I measure this state, I know that I'll give 50%0,50%.

说话人 1 30:34

Yeah, if I measure this one, 50% zero, 50% one. Good. So what they're doing is they apply these operations and then this is like they do this like end times. Great. Then they measure the cubit, then they apply some measurement operator, I would say personic.

说话人 1 31:06

So the reason why it's a bozonic measurement operator is because they have this whole thing. Whenever if I have a circuit and I ride it just so that the box is on one rail, it means that the displacements only happening to the rails on. So displacement means I'm only touching the boson. Snap, gay. I'm touching the boson and the cubic together. Displacement, just the boson, this measurement, nothing happening to the boson, just to keep it. Does that make sense? And then this measurement operator, it's something's happening to the query, but it also depends on the boson. Yeah, yeah, you might have seen this before in the gates.

说话人 2 31:53

Yeah, I said before. Yeah, I'm not sure. I don't know. Where is it?

说话人 1 32:13

I think. You start before. I think if you could scrolled. So here I can try and find it.

说话人 2 32:59

Change right here, but it's try. In charge ion.

说话人 1 33:05

So that's one example. That's.

说话人 2 33:06

It. Yeah, I know a lot about childhood.

说话人 1 33:10

It's not the one. Another example.

说话人 1 33:19

There are some more. And these measurements as well. Anyway, so that is what that means that you're doing something to keep it, but it's depending, this operation depends on the boson, same as this, you're doing something to the cubit, but it depends on the boson as well. And when you measure, you just measure the cube, okay? And when I measure the cubit, I'll

only get, I'll either collapse to 0,1, and I'll also be able to get some measurement statistics on if it's in 0,1. That's what they're doing. So they're just saying that they apply the control circuit and then they have some reward circuit. But Bush, the reward, this reward circuit is made of operations just like the control circuiters. So yeah, this is how you simulate getting quantum data because in the quantum computer can't calculate fidelity, but in the quantum computer, you can do measurements and you can do operations, you just can't calculate fidelity. Oh, yeah, right. So that's how when this reward circuit, it's in blue, the simulating how the quantum computer works.

说话人 2 34:48

Okay. And now I use the refreshment learning the method of this paper to prove your paper. The cat.

说话人 1 35:04

Testing the file system is now.

说话人 2 35:06

Complete. It can be used reference learning to get, yeah, I just prove it. So I need to do great, create states.

说话人 1 35:25

Good states as well. Yeah, yeah, you can do that too.

说话人 2 35:28

But how I know the state is survived before.

说话人 1 35:33

Survive? Like, how, like, how do you know?

说话人 2 35:38

How, how do I know the states is a new state, Yvonne. Cuz I create states. So how do I know the creating states is new or is it can be designed before.

说话人 1 35:54

The grade, the grading states? So sorry, creating a creating state. Oh, how do you know it's new? Well, you don't. I would just assume that the AI will always find. So the reinforcement learning will always find something new. If it doesn't, that's interesting too. If it finds the same solution as this guy, that's interesting to me. Okay. Yeah, I wouldn't be work. It doesn't have to be new. It just, it shouldn't. It doesn't have to be new. It's actually more interesting if it finds the same solution because that would mean that the reinforcement learning is finding like an optimal solution if it if you find the same thing, it would be interesting.

说话人 2 36:45

Okay, so I can design at.

说话人 1 36:47

First. Yeah, yeah, design however you want. Yeah.

说话人 2 36:50

Yeah. Oh, yeah. Get it. Yeah, so I don't need to prove.

说话人 1 36:55

You don't need to prove that.

说话人 2 36:57

Yeah, I don't need to prove that.

说话人 1 36:59

States. What do you mean by proof states?

说话人 2 37:04

Because in your paper, yeah, I use the traditional methods to create the state and to get the fidelity. Yeah, but if I use referensement learning to get the states, the financing is better.

说话人 1 37:26

Yes, I think.

说话人 2 37:27

So then. So I don't need to.

说话人 1 37:28

Put. What do you mean by traditional method like gradient, grand percent?

说话人 2 37:40

I think the clothes can get this idea. I'm not sure because I use the ten. The English one.

说话人 1 38:01

That's okay.

说话人 2 38:05

Have a look.

说话人 1 38:07

Yeah, take your time. This is, it's very hard to translate. I can't speak any other languages.

说话人 2 38:13

Can't. Is technical knowledge. I haven't Learned before. Oh, I remember it. A.

说话人 1 38:26

Robust. Oh, yeah, don't worry about. Yeah, I.

说话人 2 38:27

Prove the robots. Yes, I don't need to prove. I don't need to. Because the below.

说话人 1 38:34

Maybe later on in the project, if you get really good results.

说话人 2 38:40

Okay. So.

说话人 1 38:41

It's something that this robustness is something you do afterwards. So like first you show that it works. I when everything is perfect, there's no noise. And once you've shown that everything works when there's no noise, then you can add robustness to show how good it is against noise.

说话人 2 39:02

Okay, so I don't need to care.

说话人 1 39:04

Robots not not.

说话人 2 39:05

Because in your paper, I can I care.

说话人 1 39:10

Okay. Yeah, that's just something we did after we show after showing your words.

说话人 2 39:14

Okay, so I just need to, so to be honest, I just need to count this paper is the most important.

说话人 1 39:23

And to gather his, his, the thing. So use this paper for.

说话人 2 39:30

Chat arrow.

说话人 1 39:31

That's the most, it's the main idea. But then use my paper for trap lines. Okay. Cuz this paper is, it's a main idea, but it's all on superconducting kibbets. But then we want, I want to use it for trapped ions. And you can use my paper similar, but I want, but just learn the trapped iron stuff from my paper. And then prior to this.

说话人 2 39:54

Oh yeah, okay. Yeah, I get it.

说话人 1 39:58

This is great. I mean, I'm really happy with what you've done so far. It's cool that you should got the code to work.

说话人 2 40:05

Yeah, yeah, under the help of AI, to be honest.

说话人 1 40:09

Yeah, but like, that's, I mean, you're only an undergrad. So.

说话人 2 40:15

Yeah, there are too many new luggage.

说话人 1 40:20

Okay. And then one more thing is, you know, how, so, okay, so one way to show how good the, you know, how like you use RL enforcement learning, reinforcement learning to get the right circuit. I also want you to show what the state looks like after the circuit. Does that make sense? So you know how, you know how the signal function, sorry. So I want you to show what your function looks like after the circuit. That makes sense? So if you have something that's like, see how this is perfect? This is edada, it doesn't perfectly match. It's maybe like 70% fidelity or like 80% fidelity, right? So I wanna say. Your solutions are also not hundred 100% fidelity. So I would, so if you plot the this inga attitude, ask AI to plot the signal function of the state that you and of the state that you make. And it's just a way, it's like a it's a way to check that you're doing everything just by saying what looks like.

说话人 2 41:53

Yeah, I know. If I, if it's more similar, the Fed entity is more is higher driver. So, so after I PSI AI agent after it creating states, I need to make the plots to prove the.

说话人 1 42:11

Fidelity. Yeah, and then you need to sample the plots. Yes, you yes, you need make the positive to make the fidelity and then you need to sample the plugs.

说话人 2 42:20

So how do I get sample about.

说话人 1 42:22

I say like if I, yeah, so each, okay, each, I don't know if there's a signal function somewhere.

说话人 1 42:53

Okay. Yeah, so the banner function is equal to this, like  $\alpha$  is equal to  $10\pi$  paya  $\alpha$ , where paya teresis and you've seen some displacements and this means parity. You don't worry about it. Parity is equal to that. So the quantum computer can measure or get out of a  $W$   $\alpha$ . And for example, if I choose  $\alpha$  is a two dimensional vector. So it's like, so it has like a, you know, if I choose  $\alpha$  0,0, I get the middle point. If I choose  $\alpha$  4,0, I get this point. Yeah, so you can, when I say sample, that being a function, I mean, just like you can ask when you have yours, when you have your state produced by the circuit, then after, after that, after this, after you have the state that's produced by the circuit, you can then measure this from the state.

说话人 2 44:05

Okay, so yeah, use wigner function to get a sample.

说话人 1 44:09

Exactly. Okay. And that's what you can use. That's what they've done here. They've used, they've sampled the Figma function, deleting the function. So they, they, they get this, they get the cat state after the, yeah, to get the, so after the circuit, they have the cat state and then they s and then from the cat state, they sample the Wigner function. And then that's how they, and then they use that that data to, they use that sample treatment function to do reinforcement. So yeah, Melissa, I was saying learn how to get the signal function and learn how to get values from the bigger function so that you can use it to sample.

说话人 2 45:00

The train. The model, I need to machine learning.

说话人 1 45:02

To train the model, use machine learning and the reward function is the.

说话人 2 45:08

Use reference.

说话人 1 45:10

Yep, yep, reinforcement learning. But the reward function during the reinforcement learning is the wigner function values. Okay.

说话人 2 45:22

So use machinery to train a model at first to train a AI agent. Yeah, and then use reference Madam a learning to train the AI agent to get the better results to find the best gate sequence.

说话人 1 45:39

Yeah, and.

说话人 2 45:39

Then create.

说话人 1 45:40

This exactly. So it's just like this. So you get the, so the reinforcement learning chooses some parameters for the control circuit, you measure the Wignet function, and then use that to feedback to update the policy. And you just do that whole thing. It's, it's really just this. And then you have the are the reinforcement learning agent.

说话人 2 46:13

Okay. Get it.

说话人 1 46:26

They having fun.

说话人 2 46:28

I think it's a lot difficult because at the beginning, I think I just need to prove the trapped ion states. Yeah, can be, can we get the higher fidelity by using reference learning at the beginning? I just get I just know it. Oh, yeah, but I know, I know I need to design an AI agent to create. Trap the ion states. Okay, okay, I get it.

说话人 1 46:59

Yeah, so you don't you don't know if you're having fun yet.

说话人 2 47:06

Okay, so all of this, to be honest, yes, yes.

说话人 1 47:11

No, it's not. It's the first step.

说话人 2 47:13

Is the first step.

说话人 1 47:14

A lot of the code that you wrote there is useful.

说话人 2 47:17

Okay, but it can just use to.

说话人 1 47:19

Prove. Cuz like, because you're the, you're using the reinforcement learning agent to update the circuit.

说话人 2 47:28

Right? Oh, yeah, right. Yeah, yeah, Richard.

说话人 1 47:30

Which is a big part of it.

说话人 2 47:31

Oh, you're right. Together.

说话人 1 47:32

The APEX. Yeah, yeah, you're right. Yeah, it's not useful at all.

说话人 2 47:36

Okay. Okay. So keep going.

说话人 1 47:44

Yes, please.

说话人 2 47:45

Yeah, if I made a question, I may.

说话人 1 47:49

Ask. Yeah, please. Yeah, cuz I'm very friendly.

说话人 2 47:52

Yeah, yeah, yes, you're right. Really.

说话人 1 47:54

Can. And.