Crypto Research Day 2024: Ethereum v Solana Debate

(0:05 - 0:32)

But very, very privileged to be introducing Sriram Kannan from Eigenlayer and Lily Liu from Solana Foundation and Anagram to debate this very topical session. And I'm giving this lecture tonight sometimes, so like, as we hit a bit spicy, I've thrown a few jabbers in there. Well, I went through and chose, I thought that was a backhanded compliment itself, right? I'm not even sure there's a compliment in there, Min.

(0:32 - 0:36)

Very typical Min. Really, that's really sweet. And then she just slaps you.

(0:38 - 0:46)

I'm not sure about the unicorns, but you know. Excited to be here. Thanks so much, Min.

(0:46 - 0:51)

Great to do this with you, Lily. Yeah, for sure. Thanks for making it happen.

(0:52 - 1:17)

So, I think you meant to say that you should have a chat and then mink ones versus monkeys versus the high-minded digitalization and creating worlds of provisionless finance to enable any inclusion for everyone. Thank you for that setup. I can make like the, okay, if you pay peanuts, get monkeys, low fees, get monkeys, okay, there you go.

(1:20 - 1:39)

Amazing. I was actually at the main stage right after Kyle gave a talk on soul with flip E. I don't know if you wanna talk about that. I'm like, the sort of world view is, hey, build the world's fastest ledger and speed of light, global state machine.

(1:40 - 2:01)

I'm not taking her view, you know. I'm giving you the benefit of the doubt, which is absolute view, right? Fastest ledger for, and then bring all the assets, like whether it's equities, whether it's stable coins and trade them. And I think there is merit to it, but you can look at the largest equities exchange.

(2:02 - 2:15)

The New York Stock Exchange is part of the Intercontinental Exchange. You can look at the valuation of the Intercontinental Exchange. We all have Googles, they can look it up and see how much that is and how much is on hands.

(2:16 - 2:37)

I don't know why you solve it with flip E. It makes no sense. Well, I think that then you gotta kind of talk about what drives value in crypto, which is a question no one here has an honest answer to. Let's be clear, right? And so clearly most of it is actually really driven by speculation.

(2:38 - 3:09)

I think we could offer many different viewpoints on that in terms of maybe what it is, is there's a lot of people because of regulation who are locked out of financial assets around the world. And the only sort of permissionlessly accessible things with potential upside are crypto native things that they're just on a blockchain when we all strive to make them commodities, right? And that's today, Bitcoin and Ethereum. And so really what is underlying the trillion dollars I think is a Bitcoin, let's just take that one as an example is probably not really fundamental value.

(3:09 - 3:28)

What it is, is a couple of things in my mind. It's a vote against decaying illegitimate governments is one, it is a vote against authoritarianism. It's a vote for self-sovereignty, although let's be honest, it should be self-sovereign people aren't do things that are not necessarily moral, maybe nihilistic separate point.

(3:28 - 4:25)

And then also in a desire to have upside when in many places in the world, you only have downside, you have incredibly inflationary currencies, which are sort of passive aggressive means of regulatory sort of dilution and wealth theft, right? And so I think that we can have our various debates internally, which are all fun, right? For us to kind of drive it one or another. And it is endlessly fun, right? It is the source for endless content, yes. But I think that that really actually is what is driving all of these probably irrational valuations, right? And so interestingly, in my mind is as regulation becomes more intense, it may actually if the other side of this lever is the desire for sort of unregulated assets, which happen to be represented in these pure play and crypto native tokens.

(4:26 - 5:06)

In my mind, that actually is the majority of the driver, right? So then people see the potential for unbounded upside, whatever the reason, and then the ability to go claim that online forum, let's call it. And so then given that, I think that that actually explains quite a bit of what's going on this entire industry, right? And I would even posit that the, that drives the value eigenlayer, which is ability to launch infrastructure meme coins, basically VC-backed. So I think that I think we have a commonality in meme coins.

(5:06 - 5:23)

And I think monkeys are actually more friendly upon the infrastructure narrative points. I would add to that. So taking the first point, which is that the fundamental value of crypto assets comes from speculation, I think is somewhat true.

(5:23 - 5:45)

I mean, of course it's true, but there's also more to it, right? And, you know, in today's talk, I was saying that, oh, he, this money is a non falsifiable thesis. There's no evidence that you'd say, oh, you know, it's not money anymore. And I'm like, yes, that's correct.

(5:45 - 6:18)

It is a non falsifiable thesis. And that's why it's a very useful thesis. Okay, why is it? And the, so for example, if you take, I think this part, I'm in full agreement with Lily, that, you know, when you look at assets, which are even on blockchain, but are basically fiat denominated, like USDC or other tokens, you are necessarily like, you know, whenever you're using these assets, you're necessarily working on complex regulation.

(6:20 - 6:49)

You know, today, you know, we talk about the crypto dollar and USD being used everywhere, but is that going to be the case in five years, whether in India or China or, you know, Africa, the sovereign countries will like using USD? It's actually risky. It's the same thing with any other sovereign asset, because it's, you're exposing your populace to like extra sovereign, you know, token risk. And that is something like BTC or ETH.

(6:50 - 7:14)

And, you know, Solana, if it gets to that, is basically a mechanism where, you know, no country can actually take it away from you. And this means, this gives a new kind of regulatory arbitrage, which is that when a token is made in crypto native, you know, no country's against it to just to start with. So I think that's a very important driver to value.

(7:14 - 7:37)

And, you know, people, for example, in the Ethereum community ask, oh, why would it all like took, you know, all of the L2s use USDC or some other token as gas, and therefore ETH is not money. But I think the answer to that is, that's just not regulatory compliant with the second order game theory. When you take different countries and what their interests are, it's not going to be compliant.

(7:37 - 8:04)

I think still I've not addressed why I think ETH is superior to SOLVE. And I think the way I

think about it is, when you look at each of these assets, like Bitcoin, I think of the, so if you think of it, let's take currencies, let's take USD. And you can think of that, can you securely use USD? That's the zone of operation of that currency.

(8:05 - 8:27)

Can you secure USD securely if you're in America? Like if you're in some other sovereign country, you're always taking some, you know, a risk. So the zone of secure operation of a given token or a given currency is actually really, really important. And Bitcoin can only be securely used inside the Bitcoin ledger.

(8:27 - 8:44)

And inside the Bitcoin ledger, you can barely do anything, send and receive Bitcoins. That's all you can do. And what the Ethereum L2 thesis was basically that I'm going to expand the secure interoperability zone of ETH, the money.

(8:45 - 9:10)

I'm gonna take this ETH asset and we're gonna create a secure mechanism by which ETH can be used in each one of these thousand wherever related to those chains. And so what that does is that sets up a mechanism where ETH can go freely and exchange value across all these different end tools. And I know today, for example, in days, maybe you use ETH, maybe you use USDC.

(9:10 - 9:33)

But in this second order future that I'm talking about where like other countries' regulations kick in, let's start using ETH rather than using USDC. And that is where the power of ETH is as programmable money is the secure interoperability domain of ETH is actually massively large because of the L2 thesis. So you go into each of these L2s, everybody's building an L2.

(9:34 - 9:40)

And today, like a lot of people talk about DA fees are going to zero. That's actually awesome. More L2s will come up.

(9:40 - 10:03)

The secure interoperability zone of ETH just explodes. Every chain can now be launched and securely use ETH. And the way I think there's another like technical difference in the roadmap of ETH and so on, which is, so one of the view is composability is really important.

(10:04 - 10:24)

And when someone is thinking about composability, it's atomic synchronous composability. Like how fast can I interact with these transactions? And the thinking comes from, hey, I want to build this fastest NASDAQ, the fast, globally accessible New York Stock Exchange type thinking. But when you think about, Ethereum's goal is world computer.

(10:25 - 10:36)

Think of all the things that you want to do. I want to build a provable game. I want to build all these different assets, all these different things, which are verifiable and use cryptocurrencies as a backend for all of them.

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What is the zone that we can actually create? How many different such applications can you have synchronous composability? It's actually very small. Like, if you ever worked on cloud gaming or anything like that, you know that each room is rendered independently on a different computer. You can't even render a single, massively multiplayer online game synchronously.

(10:58 - 11:10)

So it's all asynchronous composability. So that's the Ethereum roadmap, is async composability, but maximize asynchronous composability. So Ethereum thesis, maximize asynchronous composability.

(11:10 - 11:19)

Solana thesis, maximize synchronous composability. So these lead to very different outcomes. Well, I think that, I mean, a couple of things.

(11:20 - 11:51)

One is that, sometimes we'll ask, okay, what's better on Solana versus Ethereum? So then, a question I would maybe ask other folks is, what about the internet is better on fiber versus a 56k modem? Everything. And, so I don't disagree with the roadmap for Ethereum. I think it's just, it is a roadmap of constrained optimization.

(11:52 - 12:27)

That constrained is 17 TPS, okay? And so, if someone told you, welcome to the internet, here's a stack of white papers of all of the amazing things you're gonna do on the internet in the future. And for each one of them, just get yourself another 56k modem and lock it in the box. So you gotta keep one closet, maybe an entire room in your house, and just have one 56k modem for the songs and the videos and the game, text messaging and browsing the internet and on-goes, right? And it's asynchronous internet.

(12:27 - 12:33)

You'd be like, cool. All right. So, I'm not down for that.

(12:35 - 13:09)

And, right. So then, but really it's like the infrastructure drives the rationalization type of thing, right? Because to me, it's just that logic is one where, all right, this is the thing we have to use, so what's the best we can make out of it? And then you get to that answer and then rationalize the roadmap. Now, I would say that everything about that roadmap to, if someone wanted to do asynchronous kind of architecture, good, right? There's no shortage of people building call them L2s, extensions, whatever you want to call them.

(13:10 - 13:19)

SVM environments are not made to go that way. But they're not critically about scaling. We were like, oh, L2s must be in Salonera to scale.

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So a lot of scaling solution is by, so additional validator, validator kind of innovation, software and hardware. And it is also things that are protocol adjacent, such as state compression and to sort of optimize performance in existing environment. So going to asynchronous roadmap is absolutely available if you like it in the same way that if you have fiber, if you want to throw all your own internet, go for it, right, that's your choice.

(13:51 - 14:12)

And so I think that, to me, it's sort of, that's available as well. And frankly, in the same way that even 30 years into the internet, we have an unlimited, seemingly insatiable demand for bandwidth. I think that will also be the case if crypto is ever useful, anything for anything beyond speculation, there'll be insatiable demand for block space.

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And so the way I think everyone is actually gonna have to go into kind of diversified it's called execution environments. The last one I'll make is the vision around getting all assets on chain. I don't really understand how that's debatable.

(14:30 - 14:43)

What else are we gonna do on chain? Like send each other text messages, we can already do that. That doesn't mean to be centralized. And so if it's about decentralized finance, then I don't know, to me, logically, it has to be about getting assets on chain.

(14:43 - 15:02)

And the other thing about having an on-chain economy is that if you're gonna be building financial markets, the best financial markets have unified liquidity. That's one of the reasons why centralized exchanges, in addition to some of the other reasons why centralized exchanges are so powerful. Binance has 225 million users.

(15:02 - 16:11)

Actually, it's the only thing this entire industry that really has product market fit, right? And because financial markets benefit from unified liquidity. So I think it's just a not winning trade-off to say, very soon in the life of growth and facilitating these cases you have to fragment your liquidity between L2, A through Z. And then what I think it actually does, I think it's actually kind of sucking innovation energy within the Ethereum ecosystem because it's, because people, as a first order concern, in order to promote their L2 and pay back their investors that gave them a 400 million FDE tokens, you know, private token sale valuation or whatever, they've got to go do the things where you get like your DeFi, your AMM, and get them over and pay off at a 10 million bucks rate for them to go launching your chain, all that type of stuff. And so people spend all their time doing that and basically playing these, like shifting liquidity around between L2, A, B and C instead of actually sort of putting things forward.

(16:11 - 16:43)

And it doesn't actually serve a purpose because it shifts liquidity around, people are paying each other and you're distracting from both innovation and actually creating a better financial product. And also you're not really paying your validators because the most profitable transactions are execution transactions because if they're trades, there's a margin for people to pay fees with, right? So then you also have sort of non-valuable validator economics. So who's getting paid, right? And who's making money rather than just shifting liquidity around, VC are getting paid.

(16:48 - 17:01)

Okay, so there's a lot. The first one is how does it scale more than one for each application? This is a pretty cool analogy. I think we could use similarly for that.

(17:05 - 17:23)

Last week, we did a demo on our mainnet. It's on this website called eigenda.wdf. If you have time afterwards, go check it out. And what we did is we took every chain, every chain, including salon and we divided it into eigenda.

(17:24 - 17:48)

Eigenda is basically Ethereum's dark sharding we just built it faster, that's it. Why is this happening? What are we doing? Of course, Solana has most of the throughput of this

experiment, but it still only takes 50% of the eigenda throughput all chains together. So the experiment's called all chains run on eigenda.

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And the concept of Ethereum scaling I think is not well understood because it's not yet executed. So when we are here to show that you can actually execute on it. The first concept is horizontal scaling.

(18:05 - 18:12)

Horizontal scaling. It's not like Ethereum people don't like throughput. We want throughput a lot.

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But we want throughput in a way that is self-verifiable. I should be able to run a terabytes per second, but each of us should be able to verify that that's running correctly. That is the core, self-verifiability is the core of the thesis of Ethereum.

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So these constraints of Ethereum are not like artificially imposed. So what happened is you start with, I want my system to be self-verifiable. What is the best I can do today? That's what Ethereum's answer is.

(18:42 - 19:01)

And so Ethereum's optimized on that roadmap from, oh, I can only run this much throughput because that's all is self-verifiable. And it's going on the pathway. And then suddenly there's this breakthrough of this, the role of centric roadmap, which basically says the following.

(19:01 - 19:23)

Says, yeah, I can take, if there are N nodes, there are N nodes, each of them have one megabytes per second capacity. How much can the system, what are the system's data capacity, right? And the solid answer to that would be if each one has 10 megabytes per second, because I'm doing full replication. Solana is a fully replicated system.

(19:23 - 19:32)

It's actually the most non-scalable system in all of crypto. Full replication. All, sorry, all crypto today is full replication.

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Not just Solana. So if full replication means every node needs to download and reproduce and send to other nodes for consensus all the data. So if N nodes, each of them have 10 megabytes per second, the system can only run at most at 10 megabytes per second.

(19:50 - 20:07)

It cannot run faster than that in a full replication system. What downsharding does, and what IgMDA does, and it's implemented on mainnet, is it scales horizontally. If there are N nodes, each of which have 10 megabytes per second, we can run the system at N times 10 megabytes per second.

(20:08 - 20:18)

Till now, decentralization was the roadblock to scaling. So if you, there's a trade-off between decentralization and scaling. Do you want decentralization or do you want scaling? It's all based there.

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Downsharding, and IgMDA is, which is a manifestation of downsharding, completely removes this trade-off. The more nodes you have, the more throughput you have. There is no trade-off.

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In Ethereum today, on mainnet, we have one million validators, each of which is taking 32 ETH. The node requirement is a few megabytes per second. You multiply one million times a few megabytes per second, it's a terabytes per second of theoretical throughput that's actually available.

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But the systems are so far behind. The engineering is so far behind. And that's what we're here to do, is to actually realize this vision of scaling Ethereum to the theoretical throughput.

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That's number one. So we are more throughput-maxing than Solana. Okay, now the next point is, if, Lily's point is, hey, with all financial, financial systems have liquidity, and liquidity is king.

(21:09 - 21:15)

And so, you know, wherever there's liquidity, everybody will aggregate towards that. And

L2s have liquidity fragmentation. Somewhat true.

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That's where we are today. And, but this is not necessarily the end state. So when you think about applications, what applications are, so first disagreement here is on what applications need to be run on cryptocurrencies? What applications need to be run on cryptocurrencies? What else other than finance? And our view, and I think this is inherited deeply from, you know, many years of Ethereum culture, is, you know, when you think about the world computer, what is the world computer? The world computer's idea is, you want to have verifiable compute.

(21:53 - 22:30)

Why would you, you know, think of an app, and ask, like, why build a crypto app? I think, you know, as a space, we don't have a good answer to this, other than in a financial setting, like, oh, I'm building Twitter, but decentralized. You know, we usually throw the word decentralized in front of it, and say, here's X, but decentralized. But if you go ask a user, no user asks about decentralized, so why is this even a thing? So our answer to this is, we call these apps with commitments, okay? So what is this? What is an app with a commitment? An application wants to make a commitment to a certain policy.

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And so imagine I'm running Facebook. It's on Crypto Rails now. And I want to run Facebook, but I want to say the following, that I will not upgrade the privacy policy of this Facebook, without a majority of the users' consent.

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This is what I want to do. How do I build such an app? So this is an application with a credible commitment. I mean, of course, you know, somebody can come up and say, hey, I'm running an application, and I'm making this commitment.

(22:59 - 23:23)

How is this commitment credible? How can you trust this guy to actually hold to this commitment? So one way to do it is, I actually make my computation verifiable to a credibly neutral layer, like Athenium. And I, so today, for example, the Facebook's privacy policy is an opt-out. You know, when there's a privacy policy upgrade, you get an opt-out message saying, hey, this is a new privacy policy.

(23:23 - 23:36)

Do you want in or out? You say, no, it's out. You exit the app and get the hell out, right? This is like 1700s England. Like, you don't like the Duke, you get the hell out, right? You

know, there's no place for you here.

(23:36 - 23:49)

That's the autocratic world that we're living in, and the Web2 platforms have created. Our view is, there is no, you know, I've given talks on this, converting cloud to crypto. Everything should run on crypto rates.

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Everything should run on crypto rates. Why? Because you can make credible commitments that nobody can break. Okay, so what's a credible commitment for this app? The app says, without a majority vote, I will not be able to upgrade.

(24:01 - 24:08)

I'm running a marketplace. I want to compete with Uber. Okay, I want to compete with Uber, and I say, oh, Uber's taking a 30% take rate.

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I want to get only a 5% take rate. I'll never exceed that. How do we build this? You can make a credible commitment as an application on Ethereum, on ILM.

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So our vision, I think, as you can see here, our vision for what is crypto is actually much, much, much larger, and that demands much higher throughput that demands asynchronous execution as a core fundamental foundational principle, along with horizontal scaling. So that's another thing. Like, imagine running Facebook on a fully replicated system with 2,000 nodes.

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It's a non-starter. It's a non-starter. You can't do it.

(24:47 - 25:01)

You can't run Facebook replicated on 2,000 nodes on the web. So there, you have to go to things like L2s, but if you go to things like L2s, you need higher data throughput. Actually, Ethereum has been guilty of slow execution on their roadmap.

(25:02 - 25:09)

This is what I believe. So we call ourselves Ethereum Accelerationists. We take the Ethereum roadmap and then just accelerate it.

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But the vision's exactly this, that if you don't have horizontal scaling, when every node is replicating everything, you actually have an inviolable bottleneck, which is you can't run all these applications on these subsets. And so this is the long term, and then you can zoom, you know, just forward projected to today. You wanna go build a new application of the type that I'm talking to, there's nothing better than an L2 on Agenda.

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Nothing better. Why? You can give instant confirmation, 100 milliseconds, more centralized than anything else, but users don't care. Let's do it.

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Eventually, it settles onto Ethereum, because you're writing data probes, you're writing execution probes back to Ethereum. So on Ethereum, everything is verified. So to build an application today, if you care about UX, if you care about interoperability, except if your only goal is to maximize liquidity and composability, you should go on a bigger tool or on something like Solana.

(26:12 - 26:42)

For everything else, the kind of applications with commitments that I'm talking about, the absolute best place to build it is an L2. You control your execution stack, you write data to something like NDA, you prove it all back to Ethereum, you can bridge ETH, you can bridge USD, you can get all the assets through this common hub, Ethereum. So one thing I very much agree with is not just, when you say assets on chain, I think the common way to interpret that is the way you define assets today.

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When you're pointing out that it should also be things like content verification, I agree. So I've brought in the definition of financial assets to sort of represent a scarcity on chain. Arguably, data is extremely valuable and important, and you don't own it, right? So that whole thing you've all been talking about for a while, that you would own data and those types of capabilities would enable a fundamental shift in the data marketplace, right? So I agree with that.

(27:15 - 28:36)

I think, for me, I would actually frame that as being a new type of financial asset, not because it's sort of the tried and true definition of financial asset, but because I think what crypto does is it allows you to create markets around things that have scarcity, right? So from that perspective, I do think that actually counts in terms of financialization

of everything. And to some of your other points, I think that, again, this is kind of like, you may even call it constrained rationalization, right? So I think that having L2s or whatever it might be is not something that Solana either does not want or does not have, right? So all of those options are still available, but I think it's just less of an immediate, existential choice to push liquidity into different environments, which I think is a bit of, it's a little bit forced too early in kind of the life cycle of what potential strategy might be. I think it's sometimes under-discussed or under-emphasized, and I didn't really realize this until sort of sitting in the role, the operative role that I currently hold, is we often talk about technical trade-offs.

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I think there are real ecosystem level trade-offs as well that don't actually really have to do with technological implementations, right? But it has to do with kind of commercial and market dynamics around things like, how do you as an ecosystem have a coordinated conversation with some form of counterparty when it comes to something like custodian support, right? And I think that where I feel like I saw this the most was in Cosmos, where yes, it's the same technical stack, but then you have this ecosystem of frenemies that spend more time kind of gently, but also not so gently, needling one another and spend a lot of time on sort of horizontal coordination rather than really pushing things forward. It's been a whole lot of time, energy, and capital on decisions that should actually be very straightforward. And so I feel like I saw this being a very painful thing with Cosmos, for example, just trying to figure out what next Cosmos chains, Firefox, to make an example was going to support.

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Whereas I feel like you see the opposite kind of phenomenon here in Solanoland, where these conversations are very straightforward, and those may, it may, I actually think it's something that people take a little bit for granted, right? Because when you're talking about building out an ecosystem, it's sort of building out those partnerships that we think are very mundane, because it's all about the technology, of course, right? But I think it actually really matter in compound. So part of it is, okay, the execution brand, all that type of stuff, the technical perspective on it, but then I do think when you have an unconstrained L2 proliferation, the incentive actually lends itself not just to Oracle, the horizontal scaling, but lateral development just as an ecosystem, because people incentivize short term to try to like snipe this or that for my chain versus wars. And I think that actually really does constrain growth over the medium to long term.

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I think this is a really true point, that I think as a community, it needs to get much more organized to basically be able to coordinate on several fundamental things. But I think this this coordination that is at the center of Ethereum is also its superpower. When you

think about, you know, Lily talked many times about constrained optimization and rationalization, which is much worse.

(31:02 - 31:13)

It's actually constrained optimization. The reason is, of course, you know, reality has constraints, and you optimize relative to that. What constraints you choose to accept in your system design is open.

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So you can have different systems built on different constraints. And the goal of Ethereum, like Bitcoin, was basically to create self-enforcing coordination systems. And when you think about a self-enforcing coordination system, having central points of coordination are actually, you know, against that ethos.

(31:40 - 32:19)

But this works a lot against Ethereum's favor, because, you know, you can't build an Ethereum phone and bundle everything vertically from the chain to the wallet, which is amazing, actually. Like, the user experience that you get when you do that is really, really much better. But the way to think about these systems is that because Ethereum is fundamentally choosing what you call this rough consensus approach to development, which is much more painstaking, much harder, but it builds trust in a way that centralized development systems cannot really build.

(32:19 - 32:42)

For example, when we were designing which chain to build back and later on, you know, we were initially thinking about many different chains, maybe even launch on many chains, all these different options. And the reason we chose to build on Ethereum is I know how Ethereum will behave as an ecosystem. It's predictable, because of, oh, you know, we said we took downsharding and implemented it.

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And, you know, if I tried to do the same thing with Toli, he would front-run me. I know it's a great idea. Like, he'll say, oh, Lightlands.

(32:50 - 32:57)

He went to Celestia's meeting, and like, yeah, Lightlands is a great idea. Let's use it. That's how it should be, right? Like, great ideas people should use.

(32:57 - 33:09)

If I'm building an infrastructure protocol on top of your platform, I'm on a very shaky basis. I got nowhere to stand here, because anything can be internalized. It's like the App Store all over again.

(33:10 - 33:16)

Any new ideas can be internalized. Nobody knows what the boundary is. If you can build a phone, you can build an app.

(33:16 - 33:24)

Why wouldn't you build an integrated app? Why wouldn't you have your own swap integrated into your phone? I don't know. That is the boundary. It's not clear.

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Building trust into a protocol that's predictable, that is gonna do what it says it's gonna do, is extraordinarily difficult. I think Bitmain is the gold standard of it, because one way to get to the gold standard is by not doing anything. It's an immutable protocol.

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So, you know, nothing happens. So nothing happens is it's super-powered. Ethereum is at the next level.

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It's a negotiated trade-off. Like, any upgrade now needs 20 different teams to upgrade, otherwise updates don't ship. So unless upgrades have already, like, established social consensus, you can't ship an upgrade.

(34:04 - 34:16)

Teams aren't gonna cooperate. So it's a very different mindset, very different system. It is a completely different trade-off from building a system which is gonna vertically integrate a phone, which is amazing for business development.

(34:16 - 34:37)

It is amazing for all these things. But as a nation-state, how much can I trust when you can build your own phone? Versus something like Bitcoin, where nothing is changeable, and something like Ethereum, where 500 people have to fight for the smallest thing. So these are different grades of, like, resilience that are built into these systems.

(34:37 - 34:59)

And it's a necessary trade-off that you forego the ability to make a quick business call to

BlackRock or PayPal or somebody else, and close the deal. What should we do today? Will you make a spicy comment? I should? Yeah, yeah, yeah. Okay.

(35:09 - 35:29)

I think my, you know, the title is Best for Builders, Ethereum or Solana. And I, my view is, in terms of latency, so one of the biggest things that Solana has to pride itself is latency. And I think, you know, Arbitrum is lower latency than Solana, so I don't know what it means for Solana.

(35:30 - 36:03)

Well, but then the point that I find to be sort of talking out of both sides of your mouth here is, okay, well, you know, Solana's not decentralized enough, but then, so it's fast at the trade-off of centralization, which, by the way, is just actually an upside-down peg. And then the other side is saying, well, then you should be building that too, because it's faster, but don't care about that decentralization thing. I don't know, guys, so like, which one is it? And so it's kind of like, I'm getting in the short half of the stick, no matter what I do.

(36:05 - 37:34)

And it just doesn't make sense to me. So, you know, I'm usually not a fan of the muddy middle stuff, right? I'm usually kind of like, all right, you know, I'm a big fan of, you always start on left curve, right curve, that's where innovation comes from, like Bitcoin started off with the neckbeards and the drug dealers and said, like, eventually, screw you, Jamie Dimon, right? Okay, but then this is something where I feel like I'm just trying to take either side of the, kind of like, okay, well, don't look now, right here, it's about speed, and then there, it's about decentralization, and actually find that, and it makes you ending up in the muddy middle, right? And then the other part that I think, okay, so in kind of the way we started to articulate this is, as we will often notice, like, what are these things, blockchains, anyways, right? It's like code, it's religion, it's, you know, LFG is all these other things all wrapped together, so try to, you know, break this down a little bit, all right, for ourselves, we realized, like, there's the blockchain itself, code base, all the other stuff, no blockchain, no nothing, right? And then you've got the technology platform, which Bitcoin decided not to do, and then Ethereum gave us, and many thanks to Ethereum for really kind of training that path. And the third is, you know, we have, we've all encountered the religiosity that you get in crypto, right? People, I first encountered the Bitcoin, and people on it, it's like, this is, this is, you're selling me something, okay, and I don't know what it is, but it's just like that passion that you're, right, and it's something you don't observe anywhere.

(37:34 - 38:27)

Who is that passionate at any unbeatable asset? It may be Apple, Apple users, right? And that's even sort of pales in comparison to how much people love Bitcoin or Ethereum so long about it is, whatever it is. So it's kind of like, there's the blockchain, there's the technology platform, and then what is that kind of amorphous thing, which is like the city and the culture? So going back to the beginning, I do think that crypto is fundamentally about, or something aspirational about it, right? There's something about, you know, opting out of, you know, what is likely to be an underperforming government that you're subject to, and that's a big part of what crypto is, and sort of what these chains potentially represent is, actually, for example, what America used to represent for a lot of people, with kind of this dream of self-determination and ego, and, you know, it's just based on your merit, a little bit of luck, and your skill, that type of thing. So, even that, I actually think it's a little bit amorphous.

(38:27 - 38:55)

We don't have a lot of words for it, but we all know it's there. We've chosen to use the city analogy for that, right? Kind of building a city, I've looked at climate similar before, starting off with not very much, and has built a city around it, and it's not just infrastructure, it's also the culture around that. And it's the culture of, you're kind of all in it together, and yes, you might compete on any individual industry that you're in, whether you're a real estate developer, a bank, or whatever, but ultimately, you still sort of have this sense of community that binds you.

(38:55 - 39:28)

Whether it's being, I don't know, a Nestle-Napoleon, or sort of, you know, identified with Solana, or Ethereum, whatever it is. I think that's a really important part of it. And so, going back to sort of the ecosystem trade-off points, it's not just about speed and the centralization of whichever solution or environment you're choosing, but then it's also, what does that do to the identity of the system? And it can all become incentivized to be like, you know, I'm the last person, or I'm like the second person, and I'm like the whatever else person, that I think you also sort of fragment identity.

(39:29 - 39:52)

And if you do that a little bit later, in a culture's, I'm gonna have nations of whatever, but like a culture or network's life, then I think you can kind of tolerate that. But I think that there's a part of this which is sharding the technology and the environment, but there's also sharding identity. And I don't see this as a point around centralization or whatever.

(39:53 - 40:25)

I think that sometimes we confuse, we lionize decentralization, and are overly willing to accept anarchy and nihilism as kind of being, we assume that that's what it means, I

don't think it does, right? But I just think that that's kind of the part where you don't see as much of the Twitter being specifically articulated, which is that there's the tech side of this, and then there's like the culture side of this. And you kind of have both, right? Amazing. Yeah, I think, do you have anything else? Yeah.

(40:26 - 40:49)

Okay, so I'm gonna tie up tech and culture in this last comment. Lily alluded to America as an example, and the way I think about these systems is they're coordination systems. It's their coordination mechanisms for various things.

(40:50 - 41:10)

And when you think about coordination mechanisms in the broad arc of history, you actually have like four different types of coordination mechanisms. You can have an authoritarian coordination mechanism, like one person, like a king comes and says, you know, I award you this land, and so this land's yours. So this is an authoritarian coordination mechanism.

(41:11 - 41:25)

And it works well when the king is right, and when the king's not so good, then everything can turn around. So you can have a committee-based coordination, like, you know, CCP or like whatever decides. It's a committee-based coordination mechanism.

(41:26 - 41:57)

You have the question of how the committee is selected, what is the committee's incentives, what is the committee's interest? That's the question there. Then you go down to more robust is democracy or majoritarian coordination mechanisms, where you need a majority of people to agree. And even that has a problem, which is the tyranny of the majority, right? And, you know, you can always slice and dice a population in different ways, and, you know, everybody's a minority in some way.

(41:58 - 42:26)

And so if you want your rights to be really protected, then you can't have a system where you're coordinating based on even a pure democracy. Then all the way down in the layers of robustness, you have self-enforcing coordination mechanisms, mechanisms which rely on neither an authority nor a committee nor a majority to actually enforce themselves. And that's what we are here to build in crypto, self-enforcing coordination mechanisms.

(42:27 - 42:51)

And when you think about self-enforcing coordination mechanisms, so that is a very

interesting kind of, taking the example of something like United States, you can think of like the self-enforcing layer is the constitution. You know, the constitution awards to each individual the right to life, liberty, property, and the pursuit of happiness. So it's the constitution to each individual is awarding these rights.

(42:52 - 43:14)

And so it's self-enforcing in the sense that if, you know, a majority goes against it, like the immune system kicks in and you can actually do something about it. So about the self-enforcing coordination, so the way actually US works is a nested coordination mechanism. So you have at the very base layer, this self-enforcing constitution.

(43:15 - 43:32)

On top of it, you have a majority, like a bill is passed in a Senate or in the House. And you know, a majority of like the senators in the House have to vote for it. But even they cannot vote for bills that are not constitutionally right.

(43:32 - 44:12)

So the majority coordination mechanism is kept in check by the self-enforcing coordination mechanism of the constitution. The democracy is kept in check by the constitution. Then you go one level up and then you say, oh, there are, you know, you create all these bills, but there's so much of uncertainty even inside a bill, you know, and so what happens is there are agencies like the SEC, the CFTC, the Federal Reserve, these committees, committee-based coordination mechanisms, which can then interpret these bills and create rules and rulings that are actually built on top of it.

(44:13 - 44:28)

And even they are too slow to act, for example, in a war, right? So imagine you're in a war zone and then you have to consult the constitution, who you're gonna shoot. Doesn't work. You need much higher agility when you're in a war zone.

(44:28 - 44:44)

So you have a commander-in-chief, the president, who's an authoritarian, but he's kept in check by the committee. The committee, which is, you know, all these three-letter organizations, they are kept in check by the democracy. They are kept in check by the constitution.

(44:44 - 44:56)

So you have this nested coordination mechanism. Why am I talking about all this now? That's exactly what the layer two architecture of the theorem is. And if you don't understand this, it's very difficult to know why layer twos work like this.

(44:57 - 45:14)

So imagine you're sitting on an application, okay? The self-enforcing coordination mechanism is forking. Like in Ethereum, if the majority of validators sign a wrong block, you can fork Ethereum. And why are you sure you can fork Ethereum? Because everybody's watching.

(45:14 - 45:20)

Because every node can, it's very easy to run a node. You can watch what's going on. If something goes wrong, you fork it.

(45:21 - 45:28)

Okay, so that's the self-enforcing layer. On top of which, you have the majority layer. What is the majority layer? Ethereum validators sign off on blocks.

(45:28 - 45:35)

That's the majority layer. On top of which, you can construct a committee layer. What is a committee? It could be an idealistic committee.

(45:36 - 45:51)

Somebody comes in, stakes a bunch of stuff, and then runs a committee. But this committee is kept in check by the majority. So, for example, in an ideal layer, if you stake and run a committee, the committee goes wrong, they're slashed on Ethereum.

(45:52 - 46:00)

Committee's kept in check by this majority. And even this committee, you need to get like 100 people, and they need to run some stuff. It's too slow.

(46:01 - 46:18)

It's too slow to handle apps that require instantaneous response. On top of that, you have a single sequencer in your roadmap, which can issue instant confirmation at the speed of light. The same user experience that we're all used to in Web2, but kept in check.

(46:18 - 46:36)

The sequencer cannot make arbitrary wrong claims. The sequencer is kept in check by, like an ideal layer committee, by Ethereum, by forking. And it's a very tightly wound system, which actually has no trade-offs, because at the fastest scale, it's agile.

(46:37 - 46:48)

At the slowest scale, it's the most robust. That's how this system works, and that's why I think it's the exact right architecture to build the future of crypto. Thank you.

(46:48 - 47:14)

So if you're, say, if you're validating Ethereum's architecture because it's working as well as the US government, I think they just invalidated the architecture. I think we all like to say stuff like this, right? But that is Google, that is OpenAI, that is, you know, all, that is Solar. They're all in the US, and there's a good reason for it.

(47:14 - 47:38)

It's because of this fundamental structure of like constitutional rights, and how strongly these constitutional rights are held. That's the gold standard. Well, I think the debate right now is that the theory of that the founding fathers had a pretty genius intent there, but then there's checks and balances that perhaps veered a little bit off of a sort of focal point.

(47:38 - 48:05)

And so maybe after 200, 250 years, they're not actually working very well, I would say. That was a direction of kind of new elements. And I think that the more I personally kind of think about these things is oftentimes, going back a little bit to what I was saying earlier, I think we overemphasize the role of structures and technology and the rules, and how you structure the rules, and the architecture and mechanisms sometimes.

(48:05 - 48:43)

We have to understand, and I think we under-prioritize how important really just the underlying culture is, right? Because one is tangible, and you can read it, you can measure it, you can calculate on it, iterate on it. But then the other one is really the culture around if you see a red light, and there's no R, D turn, and not turn, right? I live in Switzerland, I take speed limits very seriously. My culture is when I see 30 kilometers an hour, that is communicating to me intent that you do not drive a speed unsafe for pedestrians, whereas the Swiss cultures, they really do mean 30 kilometers an hour, right? So those are like cultural differences around rules and mechanisms.

(48:43 - 48:59)

And so while the mechanisms are there, they can help provide guide our rails. I think it's really ultimately actually the culture or something that kind of over time can shift from Uganda into a healthier or less healthy place. So yes, activism's great, necessary but not sufficient.

(48:59 - 49:07)

I love it. I think that's absolutely agree with the culture point. And this is one of the fundamental reasons I chose to move to Ontario.

(49:08 - 49:27)

I remember being in Eton where I'm trying to go, and going there for the first time. And I didn't know, I mean, I've been in crypto or as an academic for five years before that, but never really went to any real community conference. And Eton was the first time I went there.

(49:28 - 49:44)

And the main reason I chose to go to Ontario is that it has a culture. And the culture is there is a set of values which matter more than any individual. There is a set of values that matter more than any cartoon.

(49:45 - 50:04)

It's credible neutrality, it's permissionless innovation, it is censorship resistance, it is open innovation, all the things that it's coordination mechanisms. This is the core set of values of Eton. And there is a very deep culture, which I think very few people maybe understand from the outside.

(50:04 - 50:25)

But I find that there is a very strong propagation of this core culture in multiple different ways through the ecosystem. Say somebody is in Arbitrum or ZK Sync or some other optimism or base, they all say base is Ethereum. Why are they saying this? They should say, oh, base is not Ethereum.

(50:25 - 50:41)

It's called base. The same thing at Arbitrum or ZK Sync or any of these things. And the reason is, when you observe how debates and discussion happens, everybody goes back to the same locus, the same values.

(50:42 - 50:53)

It's censorship resistance, decentralization, credible neutrality. And this is the reason why small things in Ethereum blow up. Somebody in EF is an advisor to Eigenlayer.

(50:54 - 51:09)

Why is this such a big deal? Such a big deal because credible neutrality is such a big deal. If I came here and say, oh, Toli is an advisor for JITO, everybody's like, yeah, what else do you expect? Oh, he's an advisor for all the Solana projects. That's what you

expect.

(51:10 - 51:31)

It's the culture that is of neutrality, of the expectation of a system like that, that it's gonna be neutral, it is going to do all these things in a way that is transparent and public. It's extraordinarily high. And that's why the Ethereum culture, actually, it's a bit, I don't know why we take other words.

(51:32 - 52:01)

But I'm just saying that there's a lot of patterns of what's called cultural evolution, where it starts off with purity of intent, when it's a certain set of original actors. And then when you get over time, you get a lot of people parroting those same words, and not really actually being ideologically aligned, but being commercially aligned, and being practically aligned. And they start saying the same words, but doing the opposite thing.

(52:01 - 52:18)

So on and so forth. And so I would say that I don't think this is where Ethereum is right now, but I think there will be some point where there's gonna be, as the system grows, as this industry grows, there's gonna be a lot of people that use those words, and they're using that for either means. So that's something that I try to be sensitive to.

(52:19 - 52:30)

And then, again, so that's one thing I would say to point out. And then, let's see. Yeah, and then, let's see, what was the last thing you were talking about? I had a certain reaction to that.

(52:32 - 52:35)

Anyways. Oh, the advisors. Oh, the advisors, right.

(52:35 - 52:55)

Oh, on that one? Okay, so the last one, credible utility. I think that there's been over an extension of the mean, what I call utility, an extension from its legibility in the technical environment, to people sort of moving it into a commercial environment. I think credible utility in the virtual environment is completely stupid in your right mind.

(52:56 - 53:33)

If you want to be credibly neutral, what you should do is you should buy yourself and give everyone $50,000, okay? Take that faucet and adjust it to $50,000 per bowl, all right? And that is the way you can be credibly neutral in growth. And what I think this is,

and what I dislike about it is, how many times do you see these things where people will sort of parrot the phrase of virtue, and then act however they're gonna act anyways. So what people do is because they see the thing, they think the human activity, the natural human activity, therefore didn't exist because I signaled otherwise, right? You see this kind of diversions all of the time.

(53:33 - 54:01)

So the practicality is that in commercial realms, no one is going to be so-called credibly neutral. Now, of course, there's fairness bounds, and there are bounds of propriety for sure, but I think people should just actually be transparent about the fact that with certain, with a lot of the stuff that happens in here, it is not supposed to be credibly neutral. Technology, the protocol should be credibly neutral, and not much else beyond that should be credibly neutral.

(54:01 - 54:23)

And so I think, you know, I actually don't think a lot of people, when they really think about it, would debate that point, but I think that there's kind of this lazy extension of the concept of credible neutrality to everything, because we're talking about smart. Yeah. There is everything, and there's bad blindness, and this is, I think I've already covered it, so we don't have to go to it again.

(54:24 - 54:50)

When there's a single organization which is shepherding the whole ecosystem, it's very easy for, you know, internalizing things that other people may be building. This is an example of, you know, where credible neutrality may actually matter. When, you know, imagine, this was because Ethereum had the sensibility to say Uniswap should be an app, not a native application of Ethereum itself.

(54:51 - 55:17)

For Uniswap's successful, let's just make Uniswap into, there is a Eatswap, now it's part of Ethereum, okay? So if you start doing this, there's no difference between a Web2 company and a crypto protocol. I guess, at least in the context of Solana, I don't see where that's different, because I don't see that vertical integration happening. But that's an example of credible neutrality line that I'm talking about.

(55:17 - 55:40)

That now, for example, you know, how is it different when Solana Foundation or Solana Labs has a major investment in a liquid staking protocol? I mean, Solana Foundation discloses that they are the major investor in some X number, which they're not, right? But I'm just saying, contesting the premise, that it's enough. Actually, not to my

knowledge, right? Brands. No, I know, I know.

(55:40 - 56:12)

I'm not saying that. I'm just saying that the premise that it's enough to disclose is not true, because if that's the case, that the Solana Labs Foundation is a major investor in some of these protocols, how do I start a competing protocol? And is it really neutral? Is it really decentralized? Is the question, right? I think that would be a critique that would be a fair one to challenge a number of protocols out there, but at least in this circumstance, Solana's circumstance, it's not really. I'm not challenging Solana.

(56:12 - 56:22)

I'm just saying the premise that credible neutrality only needs to be transparency is not enough. Transparency is not enough. Credible neutrality is different from transparency.

(56:22 - 56:28)

Sure, but I think credible neutrality needs to be scoped to, okay. Well, all right. We're totally out of time.

(56:28 - 56:31)

Thank you so much, Lily. We could do a lot more with that. Okay.

(56:36 - 56:38)

Thank you. Thank you, Taïb. Amazing conversations.

(56:39 - 56:55)

I think the mostly practically between the singing unicorns like butting assholes in the sky and the pipe was passing me, why not do so? Thank you everyone for your time. For now, I think we're gonna go for a branding. So we have to stay in the five, we have a few left conversations.

(56:55 - 56:59)

We really appreciate you guys, if you don't have someone inside, bye-bye. Thank you, I had a pretty good time. Thanks.

(57:00 - 57:00)

Mostly.