

(cleaned) Participant 4 and TE Study

Livia 0:00

Yeah, thank you so much for for joining us.

participant 4 0:04

I think I had a call with you about five years ago. I can't remember for what something to do with DAOs I had no idea what it was. Maybe Token Engineering back then. I don't know.

Livia 0:17

Maybe maybe that long ago it could have been \$DAO stack\$.

participant 4 0:23

Yeah, exactly. \$Alchemy\$ prototype. Yes. Just about to actually just about to write about some of the things that happened. In that in my \$name governance, name computational law report governance\$ column. So as you probably don't want to derail the conversation, but just really quickly before we start, there was \$accountability Task Force\$, which I'm sure you remember with Daniel, Chevy, and maybe pat or some cognitive who else. \$Pedro\$'s Yeah. And sorry, remind me who it was again. \$Pedro\$. But okay, great. Yeah. Because I need to remember who it is. So I can like ask them if they're willing to be named in the article. And as the price of Aetherium kept falling, he was near the bottom of the market. And they were designing defense strategies for the DAO's and some people said, you know, they put their proposal in for their salaries and people said, Is this an attack? And so, the thing that I wanted to explain with that is that a defense is path dependent subjective, whether something is perceived to be good or bad by the immune system of the community, depending on the context, and not everyone shares the same view, even at the same time. It's really anyway, sorry, that's completely nothing to do with this. I guess.

Livia 1:49

That's amazing, because both Natalia and I used to work with \$DAO stack\$ at that time, and yeah, yeah, I actually wrote a letter I co wrote a letter when I left \$DAO stack\$ about some of the problems that I was perceiving in the community, and there was something around that around the games and accountability.

participant 4 2:12

Would you send that to me?

Livia 2:14

If I can find it? Yes, I'll look for it.

participant 4 2:17

He was looking for I made notes at the time. I remember I was like, this is a bit weird. I've got to make some notes. And I could never find my notes. So if you help me out, I'll cite you or something. It will be in the name computational report\$.

Livia 2:33

Sure, that sounds good. Well, yeah, thank you. Thank you for joining us today. Just a few notes that we have. Before we get started that we were very excited for you to contribute with us. This is a very we had but there is no study. of this kind in the field of token engineering yet. So we are gathering token engineers, practitioners and hearing from them, what has been through challenges and needs. So we're trying to understand better the field of token engineering. And my name is Livia, like, you know, and I'll be guiding us through the interview and Natalia will be helping us taking notes. So to put her video off just to not get confusing too much information during the interview and this will be audio recorded. So zoom only records video and audio, but we'll only keep the audio files and we're also having the transcription from AI if that's okay with you.

participant 4 3:47

Yeah, I mean, like, God, stop the AI is now it's too late. Yes.

Livia 3:55

Okay, so. So we can start with your

participant 4 4:02

Are you recording. I don't think notification so just by the way,

Livia 4:09

Thank you. So we can start with your personal journey of gout, how you got involved in your field of work, if you could explain us a little bit about your field of work and how you got here.

participant 4 4:27

Sure, okay. How long should I spend on that?

Livia 4:31

We have, we're planning a 45-60 minutes for the whole interview and we have about 10 questions.

participant 4 4:39

Okay, so no more than five minutes.

Livia 4:41

All right. Yeah, but some some questions are like longer or shorter, so you can take your time and if i i feel like you're going on a tangent. I'll bring you back.

participant 4 4:52

I'll just focus on the relevant bits because I've people have asked me these kinds of questions before I've taken way too long. Okay, so I'm

i Okay, I'm a

researcher, writer researcher, I guess and I've been kind of that all my career. And I've started off as in the physical science, natural sciences. So I've got a degrees in chemistry, physics, astronomy, and finance. And I then went into the field of arts and commerce after my postdoc, and then through that, I found cryptocurrency in 2013 quite kind of, unintentionally. I got really interested in the emancipator and liberatory potentials of the technology and by 2017 18 I was back at University as a student, studying financial technology in a business school, and writing papers, combining what I thought was doing I thought I was doing computer science, but actually what I was doing was like data analysis and epistemology, kind of like theories of knowledge, philosophical theories of knowledge, and I was trying to get my papers published in computer science conferences and journals, and they didn't like it at all. And I didn't understand why. And so that was 2018. I was really trying to try to get onto the scene as an independent researcher. And it was around then that I started talking with a few people online, mostly on Twitter. That would later be my kind of entry point, I guess, into token engineering itself. So I remember in my previous, I had an organization called \$Parallel industries\$, which was meant to be like a research laboratory and the end it was just me. I couldn't really find any funding into bear markets. So I couldn't get off the ground there beyond just writing papers and speaking at conferences myself, and I started speaking to people like \$name\$ and \$name\$ and from there I met people like \$Sherman Vashgimer\$. And then I think in 2019 I spoke at the \$TEG\$ \$token engineering global gathering\$ at \$DEV CON\$ in Berlin, summer of 2019. I think I was also hanging out at the token engineering meetups. Before that, yeah. 2018 late 2018 into 2019. And in May of 2019, I was also trying to get an academic job I've done all the way through this, and I completely failed actually. I was a bit early. And yeah, so I couldn't find a traditional academic job. But then I got a position at the name Media Lab\$ to found their crypto journal, which we called \$crypto economic systems\$. And that was highly relevant to the concept around token engineering. So that kind of then sparked I think, a lot more possibility and conversations with you know, it started with people like \$name\$ and \$name\$ and \$name\$, and \$name, director of name\$ and \$name\$, who was at \$name\$ who's now \$name\$. And then it started then it started to kind of balloon a bit. And so the the key word in the conference in the journal conference series title of \$name project was crypto economic systems. So you're combining this kind of systems view. And this idea that we can build alternative economic systems using these things. I think token engineering sits somewhere in that, you know, in that Melange and that mixture, in that matrix of possibilities. And so, we did a conference in October 2019 and another one in March 2020, where there were quite as quite heavy representation of what I would say are Token engineering practitioners and scholars. And \$name\$ and \$name\$, paper foundations of crypto economic systems, which is quite a well known paper in the field debuted in our journal in our conference series. And yeah, and then I moved over to a different journal at the \$name Media Lab which is called the \$namecomputational law report when I still am, and that I'm the Technology editor. And I don't have a background in law. I don't really know anything about it. But I guess the reason I'm there is because the governance the regulation, the steering of

headless, decentralized peer to peer systems shows a possible path forward for the future of the law. And you know, I've been looking at that for 10 years. That's a some some data points in that history, as we were talking about earlier around things like \$name\$, and just \$name\$ early experiments in the space. I was participating in a \$name\$ in 2016, as well. So ya had this kind of like practice and the scholarly research angle, and then this kind of the publishing and field building so at \$name\$, we were trying to bring together people from computer science, cryptography, politics, sociology, mathematics, economics, engineering. Every philosophy, everything to build the new field of crypto economics or whatever you want to call it. And I see to the mission of token engineering, the movement of \$token engineering\$ is doing something very similar, very aligned to that we're trying to bring together it's like a synthetic field that is bringing from all these kinds of different disciplines to create something new that is informed by all of these things that have come come from before and these days. I am work as a philosopher of crypto economics at the contract research house \$name\$ with \$name\$ and \$Jamsheen Varish\$h and many other people that I guess you might have interviewed in this series and things like that, and what I do there is so partly kind of project management partly organizational partly technical writing, partly philosophical, conceptual writing, partly designing the systems and partly communication between, you know, all these different stakeholders from the clients to the developers in the system modelers and, and the writers and all the rest of it. And so that is a guess. It like a whistlestop tour of it. I also have my own practice as well, which is a mix of together as a writer, researcher, it's a mix of philosophy. So I'm still working on like my own philosophical concepts and work on the philosophy of new temporal regimes. So like we think of the blockchain as a time machine, because it creates its own synchronicity, which is not connected to the sun and the moon, the calendar and the clock. It's actually the most synthetic temporal regime I think there's ever existed. And so, recently, myself and a couple of other friends wrote a foreword to a very important philosophical text on the philosophy of time from 20 years ago, called capitalism is a transcendental Time Machine by the philosopher \$Alan Greenspan\$. And yeah, so that in that we developed the theory that the decentralized clocks the blockchains make of which bitcoin is probably the most canonical example, create this new kind of machinic temporality that has really nothing to do with humans, or the sun or the moon or anything else. It's a new calendar. And I also have an artistic practice so we write plays and computer games and card games and all kinds of other stuff. And a lot of those are either explicitly or implicitly informed by \$web three\$ and token engineering concepts not exclusively. And one of the main areas of my practice, I'm writing a book at the moment about the ecological consequences and the externalities of proof of work. So I guess that Bitcoin is a great example. Of when you don't do token engineering. So it's what happens when there's no engineering. You just throw it out into the world and see what happens. So I'll leave it there.

Livia 12:44

Wow, that's so interesting. Thank you. How so? You mentioned a lot of terms that go as synonyms of token engineering and you also research epistemology and you talk about crypto economic systems. Do you think they are all synonyms with token engineering?

participant 4 13:06

I don't know that you can say that synonyms but the reason I think that at least they're linked conceptually, is that we're trying to find so the thing with epistemology is also related to epistemology is the theories of knowledge and how we develop those and understand those and the big problem we have with any kind of communication but particularly with this epistemology is communication, you know, semantics. And so, if we're trying to build an interdisciplinary transdisciplinary, whatever field or an area of study, that necessarily means is people coming from different backgrounds from different kinds of training, and they'll have different kinds of registers and lexicons, different dictionaries, different languages they speak. So very often we'll have people's using the same word to mean different things, or people using different words to mean the same thing. And I think that is actually one of the big challenges with even just defining, you know, is crypto economics token engineering, is you know, it's those kinds of questions are so hard to answer because we need to know actually, even where we are, where we are what we take to mean by all of those terms. I actually wrote an article co-wrote an article with the sociologist, geographer \$Jaya Clara Brecker\$ a few years ago, on the there was a glossary for the policy review \$internet policy review\$, which a few other token engineering people like \$Michael Zhargam\$ and \$Kelsey Nabben\$ have also contributed to where we were asked to define crypto economics. So like I am actually looking at right now so I can give you if you want it, I can look at the four stranded kind of definition. We said this term can be taken to encompass four streams of activities in interdisciplinary domain. And I think that's probably a quite safe and thorough way of going about defining these things. And I would imagine that for token engineering, it's probably also like a good way to go about that. I don't know if somebody did token engineering from the policy review. I'm interested. I'm just looking it up now to see.

Livia 15:10

So talking about definition, how would you define token engineering?

participant 4 15:16

Yeah, I mean, it's uh, yeah.

I would probably take a step back and think about, you know, where what the limits of the term are.

So in my mind,

design and engineering are different parts of a greater process. So like, for example, when I work on a project of name, I'm more involved in the design than the engineering. So like, I will be mapping out a conceptual design of a system, the flows of information or the the, what different stakeholders have access to in terms of rights in terms of flows of information in terms of flows of value, or what have you. And then once that is, once we have a design, then it would become more of an engineering question of engineering question of so we do simulations at \$name\$ so then we would have this design, and then we would rebuild it in a simulation environment, and then start to change different parameters. For example, we might do 100 different simulations of the same set of economic parameters, and then we might change some

of the economic parameters, like I don't know. The staking percentage, real the staking yield. Just think about one parameter that you would then vary set wise and you'd run these simulations several times and I'd say that is then getting more towards the engineering, where we're actually starting to, I mean, like, well, what's engineering? You know, so I think if you took a definition of engineering, then we could if we start from one of those, then we could then start to build a more thorough definition of token engineering. So I'm now asking the internet what it thinks engineering is, and it says, a branch of science and technology concerned with the design building and use of engines, machines and structures. So in that definition, design is a part of engineering. So if you take engineering it's most broad conception, as in that definition. I think it's from the Oxford English Dictionary. Then, and also, actually Wikipedia has something similar then I guess, token design would sit inside that as part of the engineering process. So in my mind, it's about design. So they say design building and use, I would say design, simulation, or modeling, and then building and then use of cryptographic and informational and value abstracted machines, structures and engines are engines is if we're doing proof of work, we can call them engines. I don't think

something that runs on proof of X

seems like such an engine to me. But yeah, I would take it from I would extend from a definition of engineering towards a definition of token engineering. And then you know, what are tokens? Well, I think of them as cryptographic abstractions of information and or value. You know, little units indivisible units of information value, which can flow around like atoms like, you know, irreducible elements, indivisible elements that can then flow around the systems, the engines and machines and structures that we've been designing building, designing, simulating building and using in the process of token engineering.

Speaker 1 19:00

What came to me also, while you were describing what you do, is the practice of architecture compared to the practice of engineering that architects will bring the conceptual layer, and they have a little bit more freedom. And then engineers will see how feasible that is.

participant 4 19:22

Yeah, I think also actually, there's an interesting corollary association we can make between what I just said right I added modeling into this Wikipedia definition of engineering so that it fits more comprehensive for token engineering. I had very good friends from school that went to university to study architectural technology. So he's not an architect, but he works with architects and he's not an engineer, but he works with engineers. He sits inbetween the architects and the engineers. And he's kind of like the go between, between these two different people from different fields with different languages, translating the architectural drawings, you know, take into account practical realities and nuances of materials of the weather of you know, the soil and things like that, which then the engineers would then use to construct in order to work with the builders and the constructors, how to actually realize the architects designs. So yeah, I think architecture is actually a really good analogy. As long as we have a view of the entire process, I guess.

Speaker 1 20:34

Talking about the entire prompt process, what is out of that process? What What would you say that TE is solving that other fields are not solving?

participant 4 20:44

Well in the definition that we've just been talking about I suppose uses in there I was gonna say because what I would say is a lot of token engineers are interested in the models that we derived from the 20th century studies of cybernetics, which tend to be loops feedback loops, where you know, the outputs of one process become the inputs of either the same process or another protocol or another process, so I suppose. The feedback in this system in this sense for token engineering more than anything else would be analysis, looking at how the system is working out in the wild, and one of the features of blockchains let's say I was gonna say was the one of the best things I don't know if it's the best, either if it's the worst, but it's a feature is that we have these blockchains are these transparent and verifiable Ledger's that are recording the activities that are happening on these networks? And therefore, we do have an awful lot of an awful lot of data on how the systems are working out in the wild once we deploy them. And that's indeed how I got my start, basically, as a data scientist in the space scraping, running nodes of cryptocurrency networks, scraping the data and looking at it to find interesting things happening. And that's obviously that's all happening way after the engineering has happened. You could argue that that whether there was any real design happening or not, back in those days I don't like and I guess in those days, we had \$Bitcoin\$ we had \$Ethereum\$ and was early days of Ethereum and not much else of real note, there's a lot of Bitcoin copycat projects and not even the massive web three rush had barely started I suppose, you know, you maybe you \$Tezos\$ had just launched I think when I was writing my papers about forks, for example, in 2018. So it's very early days. So I'd argue that there wasn't even that much design really going on. But we did have a lot of data. That's you know, the downstream consequence of having transparent and verifiable, available, Ledger's like the blockchain, so great for us. So I think that's the part is the analysis and then the reaction or the, the informed decision making on the basis of the analysis, whether that's a kind of like an algorithmic decision control kind of logic where it's like if this then do that, or it's like a learning system like a you know, AI system that is like, you know, taking in many parameters and taking much data and then learning or it's a human that's in the loop, that is the pilot that is deciding that all of these things and what's that you probably know it Livia, there's an acronym, \$name\$, observe something decide act, you know, it's it's one of these kinds of loops. You know, so that's the human in the loop gets the information and they observe and then they something then they decide, then they act. So yeah, I think that's the it's however those decisions are made is a design and engineering consideration, but I do believe that the closing of the loop is the thing that's missing from this skeletal definition that we've just come up with.

Livia 24:08

Can you share it you shared a little bit already but can you share about your daily routine? What do you do it your work?

participant 4 24:15

I mean, it's very much in my daily routine is really weird. So it's like it's gonna be a bit odd. I wake up earlier than I would like almost every day. So today I woke up to before 6am, which I did not want to happen, but I did. I tried to write in the mornings if I can. It depends what I'm writing as to what I'm actually doing. As right now I'm trying to write a joke or an editorial column at the computational law report. So I'm writing about crypto governance. I'm also writing speculative fiction about the future. If Bitcoin gets bigger, and causes environmental problems, I'm writing scenes from the future of that of the possible futures of that world say, I'm also running an organization. I didn't talk about this, but I have to, like in the last few years, I started an organization called the \$name\$, which is an event series and a residency program. And we call an epistemic skunkworks. It's like a, it's a community around event series here in Berlin. And we write theory and make art and discuss weird topics that are at least partially informed by \$web three\$ and digital culture. And so I spent a lot of my time actually running this organization, you know, doing the nuts and bolts of administration of a thing, an organization. So, today I was we just got accepted into the \$name community and education round\$ is the first time that they've run it. I get I think actually doesn't take doesn't token engineering have its own track now, which is kind of amazing. I should apply to that sometime. I know you guys. But we applied to the web three social community education fund. So I was just we just got accepted. I woke up this morning and I was then messaging everybody writing all the texts and telling everyone about that. So that's that was most of today. And then in the afternoon, I came to the workspace that I have, I share with some friends called \$name\$ in Berlin, where the event series is also based. And then I here I do a bit more of the social and organizational stuff like it would like to talking with people having meetings having calls like this, and then in the evening, tonight, there's an event here where two prominent crypto artists will be giving talks and the community around the workspace and around the Berlin crypto art scene will also be here. So it'll be kind of quite social. fun evening, I guess. So yeah, it's a mix. I live in Berlin. So I go to lots of art stuff. I try to the time I have, like at home or at my desk by myself, it's more the conceptual work and the solo writing. And then you know, when I'm out in the world, I guess it's more of the social and interactive and I do travel quite a bit as well, you know, with art and philosophy.

I give lectures and I directed a play last year, as we have exhibit exhibit exhibitions, and I give lectures and, and that's not regular, but like it's, you know, it's all it's all in there. So it's a bit. It's a bit of a weird schedule.

Livia 27:23

Sounds like a lot of fun.

participant 4 27:26

It's a lot actually, it's too much too much for one person. Hey, you only live once.

Livia 27:32

Yeah. And can you give examples to maybe polar opposite token into doing projects that you have been involved with?

participant 4 27:41

That's a really nice question. So yeah, okay, I can do this in a Yeah. We're gonna go for extremes. So I'm very involved. In Bitcoin. I found Bitcoin in 2013 and it immediately spoke to me, I was skeptical about it because I'm trained as a scientist. So skepticism was my religion. And then I just observed for a while watch some of these market cycles and I was interested in this potential for emancipator and liberatory but practice with it, like freeing ourselves from the tyranny of governments and corporations and returning power to the individual. I don't see that so much anymore. I see like bunch of authoritarians and bankers and stuff like that. So that's not what I signed up for but I think that bitcoin is this like, minimum viable token system, let's say cryptocurrency system where there's no governance on the chain. There's crypto economics, the economics of the token system are extremely simple. Like you just have to burn energy to enter a lottery to with a bunch of coins, and that is what's destroying the planet, or like, you know, could destroy the planet. And the system is deterministic. So like the supply schedule of the coins is already set. You basically can't change the network because the people that like Bitcoin is so conservative, they'll never let you change it. The only way you can really do any governance is by forking off network and having this kind of like, Darwinian survival of the fittest. So I write quite a lot about this. I have a very controversial essay that's come out, which the bitcoiners are not going to like because I'm calling them out, socially, culturally. And then I would say the polar opposite of that. But then then bitcoin is pretty much the most decentralized thing I can imagine using these kinds of technologies. There's really, I mean, there's a bunch of fake leaders, like, you know, culture post people with lots of followers on Twitter that everyone thinks are great developers that people treat as gods. And I know these people because I used to work with them at name digital currency initiative\$ where that which at the time, was the biggest funder of Bitcoin Core protocol developers, and I was spending part of my day paying their salaries. So I know these people and they're fine. Okay, people, they're a little bit conservative fine but the way they were treated by the community is like they're treated like gods and some of our art satirizes. This, like we treat them like priests in robes and things like that in cathedrals. So that's the thing I'm calling out. So yeah, even though it's a very decentralized system, there's a there's this concept called the price of anarchy, which comes out of behavioral economics. of packet routing networks like the internet. And like in Bitcoin, like the price of anarchy, you pay is like with hierarchical systems. They're very organized, very efficient. We all know about corporations and governments and universities. And then we know about peer to peer systems, which are more egalitarian flatter and fairer, but you pay a bit more in terms of the difficulties of reaching consensus. So you know, if you live in a co-living situation and 10 people need to decide what to cook every night. That is a lot of effort, a lot of communication. So the price of anarchy is this is the inefficiency that you get bitcoins price of anarchy. Is the massive energy consumption. That's the problem. The opposite to that is a project I worked on between 2020 and the start of this year, at \$name\$ where it was a new project to the to the team. I won't talk too much about it because it's the project is now public, but a lot of the work I do is in private. And so I basically took this project from inception, I did all the conceptual design. And then the systems modelers came in that we started to look at the stress testing the economics of the system we built which had a reserve like a fund value value system, a value reserve system to prevent, like, I guess, kind of like runs on the bank, I guess you could say. So it was kind of a system where people could play economic coordination games, they would stake tokens in a

system and then be able to play coordination games, a bit like a prediction market. And based on like, whether they they're what I say like a Bayesian prediction market, where it's not necessarily about what's true, but it's about what people believe to be true, and what people believe to be true. And so if you can presuppose the consensus opinions before they form, then you can be rewarded for that. And they will also reward people for connecting up data streams to the system, which this company would then use an anonymize net ingress into their large models, and they were using those for trading. Like you know, they're using different trying to use this novel data to get competitive advantage on various markets. So that was the kind of the reason that they were interested in making token systems to bring data into their financial models. And there have been these coordination games as an incentive for participants to engage in the system. Now this is a system being right this is a project token project being founded by a hedge funds. So this is like the least decentralized thing I've ever worked on. But it's kind of like if you call a spade a spade, I don't see a problem you're not saying it's decentralized, but there's a CEO selling it to you. You're saying, we're a hedge fund. This is regulated. This is like a compliance first project, we go abide by the letter of the law and we do everything by the book and so on. And so those I think are the two polar opposites because Bitcoin is an undesigned and unengineered space like Satoshi whoever he they she it were designed the system engineered the system badly, you know, the code is famously pulled and threw out into the world and disappeared. And like now you can't change it because people won't let you change it. You have to fork to change it and we saw what happened with that in 2017. Whereas the system that I worked on a name more recently, this is something that is getting updated. All the time I mean sure there are smart contracts on the blockchain, you can't change those but you can definitely update, put, put a new script on the blockchain put a new, smart contract on the blockchain and you can update your system and develop it as it goes. So the considerations of whether you put something out as a decentralized permissionless public system on a public network like Ethereum versus when you you're a company and you're doing something that needs to be compliant, something that needs to be you're accountable for those actions that you take. And you need to think about jurisdictions and regulations in different countries and your investors. Those are way more many more considerations to bear in mind than whatever has ever had to be headed with something like Bitcoin. I think those are pretty much as far apart as I can think.

Livia 35:12

From the spectrum that you're involved in, what are the areas of knowledge that you consider essential for token engineering?

participant 4 35:22

I mean, as a whole rather than an individual practitioner? Yeah, cuz it's very much a team. It's very much a team. So what did we say? We said design building simulation and use. So you can't design a system if you don't know what the affordances the potentials of the technology and the pitfalls of technology are, because everything in the real world is really based on trade offs, right. You know, that if you want to improve one aspect of a thing that might have a detrimental aspect, impact on another thing, so understanding the technology at a basic level, I'm not necessarily talking about cryptography, per se, because I think that might be a bit more

of a domain of a protocol designer. And you know, by the time a token engineers working on a project they might be working on like, let's say an application layer of a network rather than the protocol layer. But you need to know for example, how a token standard works. What does ERC 20 Do or what does the ERC 721 do and what can't it do, for example, and so you might think of your use case. And you might think that like well what kind of token can I use? To do that? Starting from the very most basic type what kind of token type suits this problem? I'm building a building? Should I use red bricks or should I use Breezeblocks? Should I use stainless steel or should I use wood? You know, that's kind of we have to start from that really basics, I guess. And then terms of the the building. Also the simulation, then like that is more of the, I guess the mathematical end of economics. I think it's something that's really important. And again, I don't know how much knowledge needs to be held inside the team, necessarily because there's also things that can be either outsourced or programs simulation programs can can help. So \$name\$ develops \$CAD CAD\$, which is open source software by now. And \$name\$ also has a you know, kind of a downstream version of that which anyone can use. It does a lot of the heavy lifting. So you don't need to know so much about the Mathematical economics is happening under the hood. You're not solving partial differential equations on a piece of paper. The computer is doing that for you or the python script is doing that for you. And then in terms of the building

Well, I mean in terms of the

I guess there's three parts right and already we talked about front end and back end. But I guess with Blockchain based systems, we also need to think about what's touching the chain, like so we need like, smart contract literate people, I think so whether it's solidity or whether it's any of the other newer languages, \$Mickelson\$ or whatever else \$rust\$ and things like that. Although I think things like generative text systems seem to be like bridging the gap, the learning gap for a lot of people to enter the space of coding for blockchains that we're coding on other systems. Things like \$GitHub co pilot\$ seem to be like, I've heard people say that the career of a solidity developers days are numbered, because of these generative systems. I don't know if it's true. But you need the people that can do so we now have three layers of the I guess the stack in terms of how we actually build the system, the blockchain part, then the back end, I guess that's the database of your thing that's talking to the blockchain, or whatever your app, and then the front end interface, and then you know, the user interface UI and the UX of all of that, you know, because if people are using your system, or even like bots, you know, your API or RPC or something like that, the way for them to interact with it. So the interface is also a part of it. And then yeah, I guess that connects to the use the UX and the UI so these are not very different to the usual kind of how a tech startup would arrange the technical parts of its operations I'd say.

Speaker 1 39:30

You mentioned a few tools already in this process, but are there tools that you use in your day to day

participant 4 39:41

I sit really at the early stages of a lot of these processes. So I mean, I don't know if it's a bit embarrassing to say this, but I will say, be honest. I work at \$name\$ and the founder of \$name\$ created the \$CADCAD\$ economic systems modeling software. I've been working there for two and a half years, and I've still never used the software. And I showed when I showed up, I said, I'm sorry, I've never used it. I learned how to use it. And they said, actually, it's cool. Don't worry about it. We have a team of people that do that you just need to be able to interpret the results. So you know, I'm working very much more on the conceptual side of it. So I might be making, let's say block diagrams, where we're looking at the flows of value systems, and making sure that stocks and flows are conserved, and making sure that there's sufficient what you call it, leeway, sufficient. Contingency, sufficient, you know, buffers for, let's say, extreme events, tail risk events like extreme market events. happen. Will that crash the system? You know, I'm from the UK, and very recently, we had a new prime minister, that pretty much destroyed the economy in 45 days, because they didn't understand like if they had built an economic model of the economy, they created the pension market, pension funds and the insurance market. They would have understood that what they were doing, would actually destroy not only the finance sector, but also the savings of the people that vote for them. And so it's those kinds of things that, you know, I'm thinking about those in an abstract sense. And then downstream from that. We then codify these kind of conceptual designs into things like \$CADCAD\$ simulation, systems, and software. And then we look at the results of those to see if the system is behaving as intended, or if you know, over many runs over a long time, or whether we're looking at you know, we see some black swan kind of events, unexpected, extreme events, which might put the safety of the system in jeopardy, but I'm really, I'm like a pen and paper and keyboard, Guy spreadsheets a little bit. I'm not really a coder, I can look at code and I obviously I can analyze data. I've got a PhD in like, laser physics, so I was like, I was staring at data and graphs for three years to my PhD. So I'm more on the analytical and the conceptual side. So I'm not really I mean, my main tool is the bag of meat water in my head, actually.

Livia 42:21

Yeah, it's your own powerful computer.

participant 4 42:24

Well, it's getting less and less powerful with time like like all computers.

Livia 42:31

I liked this analogy of the example you bring up the Prime Minister because my understanding of token engineering is that we could hopefully prevent things like this from happening if the systems are well engineered. Like you said.

Unknown Speaker 42:53

So what are

participant 4 42:54

I don't know if we can really prevent really prevent anything ever. We can minimize likelihoods. And that's really what engineering is about. We're trying to especially if you think about what

some companies called now, there is a particular branch of operations research, which has to do with the failure of things like critical, something something critical failure analysis, or something like that. Think about an airline airplane. It's got parts from 1000 suppliers in it, and Boeing or Airbus, does an amazing job of assembling it. Each of those parts has a risk of failure that is nonzero. And so that people have to kind of design engineer the greater system, bearing in mind, the likelihood of the probabilities of individual parts of that system failing and then how that impacts the rest of the system and cascading downstream failures and interdependencies and contingencies. I feel like actually, an aeroplane is quite a good analogy for a token system. Obviously, a token system is not quite like if it goes wrong. People aren't literally dying and falling out the sky. But I think it's actually quite a good analogy. Yeah, we can never prevent it. We can minimize

Speaker 1 44:06

What are the biggest challenges for for that to happen or for token engineering in general?

participant 4 44:12

So I think because we're so early, a bit like, again, like I'll use the airplane analogy, like there's four planes started falling out the sky because the parts failed. We might not have even understood, what were the failure modes. So first, we can think about the First Order failure modes, and the spark plug breaks the engine, components stops working, and then there's a problem blah, blah, blah. But then there might be like second order, things like a thing that doesn't actually fail, but it just like part fails, then that causes stress on some other subsystem in the in the in the system in the

engineered project product, then that might cause a stress which leads to downstream consequence, or there might be like, heart, heart failure of two things, which then create a vulnerability. And so those kinds of things are actually very hard to simulate model and plan for. And so I think the biggest challenge for token engineering is its infancy. Is the fact that it's relatively young field. We don't have that much infrastructure and much, that much tooling, that much expertise and practical experience. So that will come with time. But yeah, it always happens with new technologies and new technical paradigms is that until we have the experience, the systems can be a little bit erratic, or unreliable, and behave in unexpected ways. And you know, after we've been in the blockchain space for a while, both of us we've seen all kinds of things happening in unexpected ways. And sometimes that has to do with the humans in the in the system, the social socio technical system, and sometimes it's to do with the computation on the technical elements of that. So I guess like the biggest challenge is we understand neither the socio or the technical part of the socio technical system that well and only only with time only with experience, will we actually, you know, make those progressive gains and advances that we can build this into a more mature and a more, let's say, self confident field. what

Livia 46:28

What do you think are the most pressing needs within the current situation we are now?

participant 4 46:35

I think, um, again, because it's a field, its infancy, infrastructure, and tooling, are probably the two biggest ones. So they think of like, oh, think about people that are entering the space, the wider web three space, and they want to design and develop build engineer release token systems, and they may not have that much experience, so they might be new to the space. And so then they may make a lot of the mistakes that other people made in the past, which weren't documented or weren't published. Or they weren't aware of them. They weren't communicated. So like education, and tooling, and other kinds of like, let's say epistemic infrastructures as well as technical ones. So things like \$CAD CAD\$ and \$common stack\$ and \$token spice\$, things like that. So modeling says modeling systems. Also think developer toolkits are going to be a lot, you know, they, they're here deriving, I think we need more of that. So it's all about reducing the learning curve with the with the new technologies, because when the learning curve is steep, then

aeroplanes fall out the sky.

Livia 47:44

And we're almost getting to the end. We have two final questions. One is about ethics. So how do you describe the role of ethics in token engineering?

participant 4 47:57

Good question. I'm going to start from a general definition of ethics and then we'll apply it to token engineering. So moral principles. This is from the Oxford English Dictionary, moral principles that govern a person's behavior, and the conduct and activity. So this is about like how we know whether what we're doing is

right, or dubious or not, right.

And I think the problem with using terms like right and wrong is that they are subjective and they're path dependent. Like so what i i might think something's wrong and you might think is right, and the reality might be that it's not, there is no right and wrong. It's more a case of like how we see things. And so when we're building economic systems, and they involve the redistribution of resources, the allocation and redistribution of resources, that use various kinds of political and ideological lenses, or, you know, approaches like you know, whatever, stakeholder capitalism or interest bearing systems or socialist redistribution or even like communists equality. It's really down to the political persuasions of the people as to whether they think those are right or wrong. And that's why I think ethics is always it's very important, but it's very hard to get definitive answers. on it. I would say, as a general comment, after 10 years looking at this stuff, and I write quite a lot about ideology and what have you governance. I do still find now I worked in Bitcoin I look very closely at Bitcoin where unquestionably is informed by libertarian right wing libertarian politics and ideologies, techno libertarianism, very much very conservative in a financial way in terms of \$Austrian economics\$ and like hard money like digital gold digital mechanism, but also in a political sense, where they don't really want to change the thing. And they also don't want to change the thing, because the people in the network have all

the wealth, so they don't want to change that. So it's very hard to change that class structure, I guess you could say, compared to Bitcoin, the web, the rest of the web three spaces a lot more progressive, a lot more diverse, a lot more, I guess, more towards the center. But I would argue I think this might be a bit controversial, depending on who else is listening or that there is subjective opinions is that I don't see the rest of the web three space as some kind of like really progressive really socialist utopia. I still see it as like, in the center or even some of it is right at the center. Still, we are still working within a capitalist frame. We are still working in domains of scarcity most of the time, unless we're talking about like UBI projects or things like that. And we are still talking about non redistributive systems, so people when they get the coins or tokens or whatever, they're not being taken away from them in terms of like, you know, take from the rich and give it to the poor taxes and benefits that's not really happening in most crypto systems. So I would say like most of this stuff is actually still like, right of center and there's an ethical question around any system like that, which reinforces inequalities. So yeah, I would like to see more left of center activities and I do know that people like \$name\$ and the \$name\$ and \$UBI projects like name\$ do exist as concepts. I'd like to see much more of that. And hopefully with more token engineering tools and infrastructure, people will be able to imagine and design and engineer and build and use post capitalist frameworks. Not just talking about them actually build them and make them realities. And then we can see if we can really

move from the right of center quagmire that a lot of the web three and crypto spaces is stuck in.

Speaker 1 52:18

We would have one more there, but I think we we don't have so much time that was about thoughts on how to increase diversity and inclusivity but maybe I can ask you that after you're open for a few.

participant 4 52:31

I can just go real quick if you want, like for 30 seconds or so. Yeah. Yes, it's something I think about a lot. So I run this event series in this collective in Berlin. Diversity is something we think about a lot. I've been in the Bitcoin space, which is one of the least diverse environments I've ever seen. I spoke at a conference in Amsterdam in 2019, where there were 25 people on the lineup of speakers. And I was the only person that wasn't a white male. So like I've seen like extremely Undiverse environments, to the extent where I was uncomfortable participating. In it, because I realized that I was the diversity person. And so yeah, web three spaces also, it's not that diverse. I think this is a kind of a structural overhang from a lot of technology fields, and which don't tend to be founded or started by people that are able to take risks. And we know that type A alpha personalities that are more like startup CEOs or whatever, are more likely to take risks, and they may be more financially able to take risks. And we know from evolutionary biology that men are more able to take risks than non men. So I think there's a structural bias. There's been encoded in the history of a lot of technology fields, and that's what we're gradually gets overcome. I used to work in music. And the music field I was in was very technical as experimental electronic music. And it was also very undiverse 15 years ago. Now, it's quite diverse, actually. So the generations shifted each age, but it's still the old white guys that are the famous ones. And the kids are the more diverse ones that are moving up the ladder. And I see

the same thing happening in the web three in the blockchain space. So I think is like we have to make efforts, but also time is the kind of the force that is required to upend the structural inequalities, but also like time, takes takes time for these things to happen. And so it needs intention. It needs positive action, but also requires patience. And that's unfortunate.

Livia 54:41

Thank you. I'm glad you answered. And on. Would you have like three extra minutes after the top of the hour? Thank you and finances? What is your perspective of the incentive to be a practicing token engineer? What are the typical rewards, the average salaries?

participant 4 55:03

I can't speak about anything really beyond my own experiences, which are between the public and the private sector. In the public sector as an academic it's pretty bad. So in the UK, I was applying for academic positions in 2018, applied for 15 academic positions, salaries were between I applied for a job at the university. Is this all going to be public or as part of it? Like I can't remember how I don't know how much I should say,

Yeah, this, this will likely be

Livia 55:35

public.

participant 4 55:36

Okay. Yeah. So I applied for a job at an extremely prestigious university, and the salary was not enough to cover the rent, to live in that city. And as a universe like a let's call it Harry Potter University, and Harry Potter university, you couldn't even pay your rent with a salary. And you know, I was in my late 30s, with four degrees would not be able to pay my salary doing that job. It was a relatively junior position, more junior than I would have otherwise taken a postdoc in the UK is like upper 20s to 35,000 pounds. A professor is like 40 to 50. The UK is just generally very bad for wages. That yeah, \$Her Majesty's Treasury\$ that runs the finances of the country. advertised the job for the head of cybersecurity recently. And it was destined less than 60000 pounds to do that. So imagine like, you're not going to get a good InfoSec person to do that job. You got to get like an intern basically. In the US, where I worked at another very, I applied for a job at a very famous university. And that salary was okay by European standards was like, almost a Senior Lecturer by European standards, but it was very low by US standards, and by US standards or cost of living in the town with that famous university was based it was also kind of a basically borderline, I won't say poverty wage, but like you don't have much left after you paid for your rent and your groceries, let's say, in the private sector, I think it varies a lot depending on what you do. So I'm very fortunate that I'm considered an expert or a specialist, and there's not that many specialists with a lot of experience. So I'm, I don't actually work that much. So the number of hours I do, I don't have a retainer and I don't have a salary. So I'm actually more of a contractor. So I am recompensee by, my hourly rate is offset by a relatively good hourly rate, let's say, which is significantly higher than you would get in academia, you know, like maybe two or three times where you're getting academia. But then I don't work very

much maybe have on average. Let's say one day a week or something like that. And I also work in private education, and that is very well paid. But it's also kind of a very specialist job that I do, and I don't think many people would have access to so it really varies so much. It's, it's really remarkable, but I think actually on the whole in terms of my experiences anyway, people that have expertise and or experience expertise that's relevant to token engineering, or experience of doing and thinking researching around token engineering, in general, quite in demand and quite well remunerated. And the working conditions are quite good. I'm very happy with my working conditions, and the amounts I get paid for my time. I could probably do with a bit more work, if I'm honest right now, but it's also fine. Ya, so I think it's, it's quite a good field to be in. But I think that the barriers to entry that we talked about earlier, are one of the challenges to get into the field. Yeah.

Livia 59:01

Thank you. And just as a what do you wish for the future of the field? Because you write so much about the future.

participant 4 59:09

I wish for maturity, like, I think it's coming. I think it's coming. So like, we need more people to enter the ecosystem. We need more projects building using these principles of responsible designing and responsible engineering. Then we need more tools by the technical or educational infrastructural ones, and ways for people to be able to build and develop and test and release the token engineered products and services that they can conceive. So I think it should really just it again about time, and to maturity is coming. It's not quite here yet. So I'm very enthused and curious to see where we are, let's say in another five years and another 10 years time. When there's probably a whole bunch more foundational infrastructures by blockchain networks, or even whatever else comes after blockchains quantum lattices or I don't know. And they will be building applications on top of those protocols. And there'll be new affordances new possibilities. But again, I'll come back to what we said earlier, Livia about economics. And ideology. I also wish for post capitalist imagination. I don't just want to see scarcity and accumulation of wealth that we already have that we've had that forever. I think we can use these tools to move beyond the constraints of scarcity and capitalistic accumulation. And I want to see you post capitalist features. That's what I want to see more than anything.

Livia 1:00:42

That's beautiful. Yeah, I keep thinking that we're living in imagination crisis. That's what it is.

participant 4 1:00:49

Some people have imaginations, but it's not the builders in my opinion, from I can see like the circles moving in Berlin. People have wild imaginations, but they don't have access to the resources to make to try out they're there to test out their theories. So I'm interested to see like now more interdisciplinary commingling more kind of ideas coming in from radical art philosophy and design and architecture. And then those meshing with engineering and computer science and cryptography, and systems and systems design. So yeah, I'm excited for the future. But also, like, I don't know how we're going to make these joints happen, these connections.

Livia 1:01:33

And lastly, do you have anyone that you would recommend us to also speak and this study and whose work you admire?

participant 4 1:01:42

I guess you've probably already got people like my \$name\$ and \$name\$ Here, these kind of big hitters. Have you thought about speaking to \$name\$, who works a lot on constantly constitutions that govern networks, so he's kind of like a governance person. He also works with a \$name\$ occasionally. I think you can think of him as a governance person that comes from traditional constitutional politics and governance. And it's using the ideas there to try and find some kind of like middle ground between, like code is law, kind of governance minimization, and systems that are, you know, really hard coded. So constitutions can be changed. We have collections, we have assemblies, and we change constitutions. So think about immutable mutable protocols, mutable governance protocols, I think that would actually be very interesting. Path forwards for token engineering is something that we draw on at \$name\$ conceptually.

Livia 1:02:39

That's great. Thank you so so much, it was a pleasure to

participant 4 1:02:44

speak with you. And I'm curious, like so what's the next what? What is this project look like from from, from the sky from the bird's eye view. You're doing these interviews and I guess you're going to work them up with text and maybe with audio or something like that?

Speaker 1 1:03:01

Yeah, we're gonna produce an analysis of all of the all of the interviews we're having, and our overarching question is how to define token engineering. And what are the challenges and needs so we'll have a published article and for the analysis, and we'll send to all of you participants in the in the medium that you chose, your your preferred, contact choice.

participant 4 1:03:31

looking forwards, so I really enjoyed the conversation. Yeah, thank you very much. To both of you for facilitating that. And yeah, just I guess, just keep us posted when it's when things happen.

Yeah, for sure. Thank you. Yeah. Thank you both. It was very refreshing to hear you.

Oh, that's very sweet. If you I mean, if you wouldn't mind sending me the audio as well. That'd be great because I never make notes. I just say what's on my mind. And sometimes they say things I'm like, Oh, I wish I remembered what I said.

Absolutely. Yeah. Great. Thank you. Thank you. Alright, have a good day.

Unknown Speaker 1:04:05
You too. Bye.