

(cleaned) Participant 30 and TE Study

Nathalia Scherer 0:00

Hello. Good thanks for joining us. I believe I've maybe I've met you before through \$name\$.

participant 30 0:12

Maybe maybe at the \$name\$ \$name\$ from a couple of years back that might have been.

Nathalia Scherer 0:17

Yes, that was it. Yeah. Good to see you again. And so as a reminder, this is a study to help us better understand the token engineering. Now and dive more into how it's been described and how it's also being developed and evolving as we go and you can withdraw at any point in answering and yeah, we're gonna record and keep only the audio from the interview. You also have otter AI here that will help with transcription.

participant 30 1:07

Great, great. I will need to jump out very briefly just to let you know that to let my son and when he comes home from school that I'll jump back in, but I'll give you a fair warning to give a cut.

Nathalia Scherer 1:17

Sounds good. Do you have any questions before we get started?

No, no, and I appreciate the ability to take the time to kind of have that rescheduling and apologize for the delay but no questions were great to see in advance and so good to go.

Wonderful. Oh, let me just start the recording

Livia 1:43

now turn my video off. It's reporting in progress if people want to look at

Nathalia Scherer 1:57

so again, thank you. Thank you for joining us and and to get started, can you share a bit about your personal journey and how you got involved in your field of work? Sure.

participant 30 2:11

So I came out this, this entire field of endeavor, really from the economics background, most of my work is from looking at essentially the applications of mathematics and economics and in computation. And from that lens always looking toward incentive structures. You know, how do you convince people to do something that's in their best interest? How do you create mechanisms or create structures that people say Ah, given that I'd love to do this, and after finishing out my my PhD at Carnegie Mellon University, I started in the academic world, just working within that realm, and really trying to look at things on looking toward the idea of implementing how do you implement these types of incentive mechanisms in a computing environment? And one thing led to another I ended up putting one foot in academics one foot in,

in consulting so I kind of had the sort of public private kind of tension going on. And then we just slowly started to see this amazing advent of these, these contracts that you could write in code and everybody could see it. Everybody could understand, you know, validate that this is what it's supposed to be doing and all of a sudden, you could sort of hang your hat on these things, as incentive structures, clearly trustworthy from the point of view of being able to at least see what their effects are. And from there, it was as a research question from my side. So gradually, it became something that was able to occupy the forefront of the of my work on really a synergy between optimal control and control theory on the one side and incentive structures on the other.

Nathalia Scherer 3:42

Thank you, and as we so we're gonna dive a little more into definitions now. And yeah, how would you define token engineering?

participant 30 3:55

So I guess I would say that token engineering is a very, very broad definition of token engineering as a field. I consider it to be actually a field in its own right. It's really involved in designing and implementing structures that provide value transfer, and its value transferred a specific way. It's cryptographically, supported assets, and programmatic automation. So in a nutshell, that's kind of if I was gonna give an elevator pitch on what it would be to somebody who'd never heard of it before. That's kind of the way I would describe it.

Nathalia Scherer 4:29

And what would just say that token engineering is doing that other fields and disciplines are not.

participant 30 4:34

I think the key distinguishing features are that you want a critical path to value transfer that is as trustworthy as possible without sacrificing privacy. And if you have those two pillars that are in place, then there are a lot of different modalities that you can adopt, except to have something where everybody agrees on the rules and understands it but doesn't need a big brother or a centralized authority, kind of looking over the shoulder in order to enforce certain certain aspects of that. value transfer. So I think that's something that is uniquely let's say predisposed to this and that can be applied to a variety of different types of applications. You know, ranging from just you know, bank transfers to something else, but always that tension between privacy on the one side and trust on the other.

Nathalia Scherer 5:23

And, and now going more towards the practice of token rendering, would you would you consider your work as directly as a token engineer.

participant 30 5:39

It is encompassing token engineering, I think it probably sits at one level above in the sense that it's more general that if you are designing systems under which this trust and privacy dichotomy is so important, you can do that with a variety of different substrates. One of which of course, is

to use we supported value transfer that we will be defining as a token and then therefore, the mechanisms and the way in which you build a term for materials is then the engineering component. But you could be agnostic to the technological substrate and you could say, Look, I'm trying to build a system, maybe I'm going to be using instead of cryptographically supported asset transfer, I'm gonna be looking at value transfer through, I don't know large language models to take a \$chat GPT\$ sort of you know, it's Oh, Corrado, we just say hey, you know, maybe this is something that we want to provide that ability to build out these incentive structures, from variables like AI based materials, what structures do we need to design so I think there's a design element which can be brought to bear upon the question of how to do that within a cryptographically supported environment, but a lot of my works in the air the space above that, and so it can be equally applied to a web three environment or token engineering environment formally as it is to more general incentive structures.

Nathalia Scherer 6:57

And could you share a bit more about your work routine, so maybe examples of typical tasks, maybe processes that you need to handle routinely? And also specific tools that you use in that process?

participant 30 7:12

So most of the time, from the from the let's say that the daily ritual point of view, has to do a lot with client work with the clients who have come in with a specific question or problem that they wish to solve a certain set of stakeholder goals that they try to implement a lot of my time is spent on identifying the requirements that are necessary in order to support goals, or to understand how goals can come into conflict with each other and with the countervailing forces that are involved. So my design is a big chunk of that. Mathematical specifications are a big part of that. Because you want to place that into a quantitative context where you can get as much predictive power as you can. That's often taken in the pipeline, which I will be at least a part of it the beginning to a computational implementation. \$name\$, for example, uses \$cadcad\$ as a simulation framework of modeling and simulation framework that this is a natural feeding point from the mathematical specification and whatever analytical conclusions have been drawn. But you can actually then see these things in a computational framework. And then a lot of analysis and then preparation, preparation preparation for presenting to the client a lot of work on ensuring that this information is is legible to the person who people who have asked for it, and to make sure that it does doesn't go as something as technological mumbo jumbo but also is articulated within the context of the question they're attempting to answer. So that pretty much would explain a daily path and as chopped up into different pieces, because different parts of different projects are in a different lifecycle. Tool component wise, quite a lot of this of course, for communications and comms, you know, we're just using we're in the world of \$zoom\$ and so on for synchronized and communication. \$Slack\$ is the main the main modality for async communication, some \$emai\$, but pretty much I would say almost none at this point. In terms of looking at analysis for \$notebooks\$ of simulations, a lot of the \$Jupiter\$ frameworks is what we use \$Python\$ is the language of choice for most of the \$data science\$ or the data simulation that's been done for analytical computations and work of the like. I confess to using a lot of pen and paper just to scratch out ideas, but there's also some leveraging of tools that are that are

out there to do some symbolic computing as well, typically, but yeah, in fact, I would say exclusively at this point, open source or free free toolkits. So I haven't used and haven't been involved in using paid or paid systems like \$MATLAB\$ environments or \$Mathematica\$ environments.

Nathalia Scherer 9:51

Thank you. And you've already tapped a lot into this in some of your previous answers, but can you specify which areas of knowledge you consider essential for the field of token engineering?

participant 30 10:05

Yeah, these are that I'll do this with, with a very explicit bias from my point of view, so you'd ask somebody else I'm sure gonna give you a different sort of ranking or even a different ordering of totally different ideas or topics. From my perspective, having a handle on \$Applied Mathematics\$ is very useful. And I'll give just as one example of something that is, so that doesn't sound unapproachable to people, because it's quite the contrary. Being able to understand a game theory problem, a problem set up where you're trying to have two players who are playing a game and maybe one person's gain is another person's loss. The analysis of that the way we set that structure up and understand okay, what's going to happen in the long term, if we repeat this game many times? What would we like to happen if there's like one particular outcome we would all vote on and say that's the best one? How can we do that in a decentralized environment? These are all kind of questions that an Applied Mathematics perspective really helps you to be grounded in an understanding of what is what it is that you're seeing. When a from a purely qualitative point of view, a stakeholder or or a client would come in and say, We want to build this amazing thing. And you just have to try to translate all of that into something that can actually be used as as as this ability to build from the technological materials, some kind of a structure. That is it's amenable to things like analysis and simulation. Along the same lines, of course, and underlying that, that transfer from materials to structures is engineering. So it's although it's not, I would say necessarily a formal requirement. Certainly in my case, I don't have a formal background in engineering. The process by which an engineering lifecycle develops something from ideation to its actual productization is super valuable because there are all of these little feedback loops and iterative processes where you go back to the drawing board, go back to the construction, get to simulation, realize something go back to the drawing board. They've done that so well, and it's so hyper optimized from the engineering background and anybody who comes in with that perspective on I'm building something it's not enough to just have the idealization. I'm actually creating something people are going to use. That's super valuable. And and of course, stitching all that together and running through this and certainly just a sign of the times when you look at cryptographically supported value transfer. some familiarity with computer programming is kind of necessary and you kind of have to come in with a little bit of fluency at least in one or another language. And again, I would I would leave is Python as being kind of a de facto language to have in one's back pocket.

Nathalia Scherer 12:50

And so now we're gonna go more towards challenges and needs in the field. And could you say a little bit about challenges that you might have faced in your work with token engineering, and also perhaps common pitfalls when practicing it?

participant 30 13:07

Sure. I think probably the largest challenge is offshoring that when you're speaking with somebody who wants to design and build a system, and they say, Please engineer the value transfer in the system so that it works. Well. It's that you have to be two sets of translations. One is to get from the normative descriptions and qualitative discussions to something as I mentioned before, this kind of a quantitative framework and that can be a challenge. If you aren't speaking the same dialogue or dialect, let's say between the objectives that are discussed, and what it is you're operationalizing. So in particular, if somebody says we want to build a model that will save humanity, then you have to really drill down a lot and it may take a lot of time to get to what is it that you really mean? What do you mean by humanity? What do you mean by save? How are we supposed to take that and construct something actual that will then be released in the wild or will actually be productized? So that conversation getting down to the point of the model is one challenge. There are some very specific ways we can help to drill down from general to specific, and then the other challenge is, of course, going back the other way. So that once you've got results, you say hey, look, we want to assess your your query, on the basis of these metrics, these assessment conditions, getting to the understanding of why those are important back up to the top can also be a challenge because of course, when people say, for example, you know, our goal is to save humanity. There is this idea that that's an absolute, you say, hey, look, we want to save humanity, period. And if you say well, you know, we were able to assess the model and it has a 95% chance of saving humanity that may or may print it as saving humanity from the people who are listening. So you have to really go through and describe what it is the model is capable of the simulation is capable of, and the structure that's being promoted is capable of, and that translation is often also very difficult. So quite apart from the token engineering process. I include the things that are actually on the endpoints, the stakeholders coming in and the stakeholders going out as part of that process. Because that I think, is the to do someone isolation would actually be difficult because you could just create a model and then it wouldn't matter if we could use it. So in by including the stakeholders in that process, or it becomes more challenging but I think it also is something that when you explicitly address it, then you can say to them, for example, this particular model is fulfilling what it is you have described that you want. So that's, I think it's probably the largest challenge that that we typically would face when you have a specific client interaction. A little bit also on the side of things, is the notion that when you're engineering a system, you're engineering it to be safe. And you want to really define well what that means to individuals both from the outside and also from the inside of what the system is designed to do so that people aren't in danger or are not placed in danger when they're using the system. And we've seen a lot of systems that are have very, very, very nice goals, but when they are engineered, they leave things to be desired and in particular, of some examples we've seen in the past in history where tokens have been engineered, but in the end value has been transferred away in an unexpected fashion or his leaked away or has been to use a normative term stolen, although the system itself is just doing what the system has been written up to do, but that value transfer didn't go the direction that

people thought and that would be considered an unsafe system. And so ensuring that that that's integrated into the notion of why do you want to engineer a system and not simply just build something? That's also kind of a challenge at times?

Nathalia Scherer 16:37

Yes. And what would you say are pressing needs, that the token and for the token engineering field to address

participant 30 16:50

I would say at least part of the system, part of the problems that we have seen this in this area is a lack of standardization. There are very few organizations that are placing explicit standards upon what it is that they would say is a successful system that has been engineered versus one that is unsuccessful, except for an ex post sort of forensic analysis where you look back on the problem and say that probably shouldn't have been done or that was inappropriate in that environment. And the reason I think that that's important is because that goes hand in hand with regulation. So if you don't have standards, then you are exposed to the risk of not just something going wrong because the standard isn't approved but also from everything that comes upon individuals who get angry about the things that didn't go right. And say we need massive regulation or overly restrictive regulation in order to ensure that these systems themselves are open to the possibility of redress in the event of a calamity or a drain of value. And I think if you have standardization if you say hey, look, we've standardized this, there's actually an internal ability to say this is a good system and this is not a good system from these criteria, then you're giving yourself the degree of freedom that a regulator will say they actually know what they're talking about. This is nice, this is good. We can hang our hat upon this. And much in the same way as you can say given a particular manifestation of an ERC token you know, and ERC 20 Okay, I know what that's going to do. That's a template I can hang my hat on. You also give scope than for regulators to provide that degree of freedom so that the system, the token engineering field itself doesn't become stifled or compressed or receives negative feedback in such a way that people who are really interested in the idea at first see the regulatory scrutiny being sort of over the top and say I'd rather not participate.

Nathalia Scherer 18:42

Thank you. How about ethics? Would you describe it as Do you see it as an important piece of token engineering and if so, how? Would you describe that role?

participant 30 18:55

I think it's very important, I think we we have an environment in which you can do harm from transfers that go the wrong way. And depending upon the use case for for whatever the project is, that could be something as in quotations as simple as somebody losing their shirt they simply invested in and lost because of an unanticipated engineering mistake or oversight or lack of a standard and therefore lack of a principle, but this goes all the way up to things that are very much at the height of regulatory scrutiny, things like, you know, influence into GDPR data protection, how do you ensure that people have enough privacy in their online lives that they don't actually feel that they're actually being exploited from that how do you prevent exploitation

of individual characteristics? How do you ensure that when a token is something that is of value from the privacy point of view, or the ethical point of view for an experiment using, you know, for example, you know, trials or clinical trials for medicine, that that's something that is being adhered to every single step of the way in an ethically proper manner. Without that ability to state that your system is engineered for safety, that sort of step zero, you can't proceed to the next level and say, okay, given the safe, what do we mean by that safe for who how are we implementing that safety? What does that mean to be ethically responsible, given the fact that we built the system for safety? So I think, quite apart from it being sort of a side issue, I think it's actually one of the central issues of engineering any system and the same way that if you were engineering, you know, a bridge, you would want the bridge to be safe structurally, that's step zero, but you also want to ensure that you're not doing something in the bridge that is ethically wrong. Like for example, you know, keeping out certain individuals or certain types of people or ensuring that there is a collapse of diversity or inclusiveness that that a bridge, in principle shouldn't care about. So these are the factors I think that are that are just as as, as pertinent to engineered systems in a token environment.

Nathalia Scherer 21:05

And in terms of diversity and inclusivity within the field, do you have any thoughts on how to increase it?

participant 30 21:16

Yeah, I think that the the key component, and it is it is probably a tool that is discussed a lot but it's very hard to operationalize as education, if you can bring people to bear on the idea that you can utilize these particular types of environments, to the extent that they can be considered safe, that they do have a standard and that they can enforce a particular ethical direction that you would like, then I think what you're doing is then opening the field up to saying and if you're the best at this type of thing, if you're thinking about these things in this context, please come on board. There are very few other barriers that can be explicitly placed in between your interest in that as you see that as an edifice worth building, and the ability to step right in and building it. So I think this is one of the nice things about this particular field is it at least in terms of the way in which you can approach it ex ante? There are very few barriers that can happen once that education, that little that step of Education has been fulfilled, and of course, the rub is there, right? I mean, how much of an exclusionary exclusionarity let's say, comes from simply lack of opportunity for education. That's definitely the main component but something sort of on the the other side of this of this question.

Nathalia Scherer 22:40

And we've talked about the broad definitions of token engineering and of course, as a new field, it can be hard to specify some of the components of the of the field itself. And something that we've been looking at is also incentives and the financial side of token engineering. We've seen that there's a broad spectrum around it. And I'm curious to hear from your perspective, what are the incentives to be a practicing token engineer and also ask if you have thoughts on what what are typical rewards? So both terms of value and form? Okay.

participant 30 23:27

Yeah, I think that the, if you were to place it within the context of knowledge gains, then if you're interested in this type of a subject and the reward is being able to engage at really the bleeding edge of a particular technology. So in this sense, you'd be kind of like, gaining the same kind of reward from engagement that you would at the forefront of things like artificial intelligence at the moment. So we're at this point where these technologies are moving so incredibly rapidly, that being involved in the community that's there and the ability to contribute to that community is amazing. And so certainly, as somebody who's in the later stages of their career, you know, I'm always amazed by how fast people can innovate something and then how fast and easy it is to then understand that the knowledge base that it comes from, so instead of having to wait for a particular journal article to be published with a three year window, and then you wait and you get the Publican and you read that and say, Oh, now innovate off of this, the turnaround time is compressed. And so one of the major incentives of this is this fast ability to acquire knowledge and then act on it, as opposed to being in a particular let's say, track that doesn't necessarily prevent you from doing the same, but really extends the time at which it occurs. So I think that's one of the non pecuniary benefits of this office environment. From a value transfer point of view, that kind of depends upon how you're approaching this. It's such a new environment and such a new, a new discipline that I think many of the different startups that are that are involved in this, have their own perspectives on you know, the rewards that they can provide. Many of those rewards of course are provided according to the ability of individuals to assimilate the technology fast, which means you're typically skewing toward younger researchers, or at least age researchers and then more senior ones. And so perhaps the career path at that point is really to bring people on board, engineer an amazing project and then you move on from there to another project. So it might be starting out as a project specific value flow. But I think as we get to and gain more money, we're going to see more and more organizations that are approaching this from an engineering perspective from the beginning of something like a \$name\$ environment where you then have a stratum of individuals all the way from early stage to late stage, who can all contribute different levels of expertise across a variety of projects. So you have both the within Project track and then you have the ability to kind of help out projects across and all across their different life cycles. And one of them, at least from the point of view of being able to accommodate a wider spread of individuals would be more along the lines of can I build a career in that environment? projects themselves? They're startups they're risky, you don't know if that's going to be something that is going to give you a career without one specific project for your entire working life. It certainly would provide you with that nice ability to move from one project to the next. But eventually that might not be something that people consider as a high priority. For them as they get into their later stages of their career. So we're sort of in that middle point of, is it something that you can build a career on? I mean, my feeling is that it will be as of this point, we're sort of on the fulcrum there just may not be as many firms available doing this now. To be able to accommodate that and of course, part of this has to do with the fact that enterprises themselves don't really have large token engineering departments yet. So we're not seeing massive multinationals having an entire department where they've hired you know, 40 or 50 individuals, all of us token engineers to work internally in their in their environment.

Nathalia Scherer 27:01

And what would you say is an average salary of a token engineer?

participant 30 27:05

Um, I honestly couldn't tell you. I don't know. I would have to only go with the opportunity cost of assuming that it's probably commensurate with an engineer, someone with an engineering background having that ability to choose between a job that's not in token engineering, but still uses engineering skills. Or maybe somebody who's working in incentive systems or financial economics or financial engineering, designing of instruments in finance and then saying, what I want to work in token engineering because this sounds cooler or was more interesting. So there may be different opportunity cost and balancing points for different individuals who still carry the same ability to leverage their backgrounds in token engineering. I'm not sure there is a standard yet, to my knowledge.

Nathalia Scherer 27:49

Now looking towards the future, what do you wish for the future of the field? And how do you see it in the next three years?

participant 30 28:00

I guess I would pull on the red threads sort of throughout the talk. I really hope that we can reach a level of standardization of an understanding of the value flows that we could build systems that people from the outside who say how would I make this in the same way that they see and take for granted bridges that are built around them in the world. We all know bridges require engineering. We all know they require care. We all know that there are other factors that are involved in the construction. But at the end of the day, we all know we've driven over a bridge even if we don't know how it works. We trust it. We trust the people we never will meet never have met in high probability of likelihood. And yet we drive over these bridges and we say this is good because there's a whole standard that's been set up and there's of course oversight that allows us to ensure knock on wood that these bridges maintain their stability. Of course, we all know tragic exceptions that do occur, but they serve only to reinforce my feeling that at least in the token engineering environment. We really are in the step now, where if we fail to play standardization at the top of one of our priorities in the near future, we will find ourselves in an ever more, let's say, let's say unfortunate series of circumstances where we see projects that lose a lot of value and a lot of safety for individuals. So standardization, I think is probably the the first thing I would like to see within that context, the adoption of token engineering as a formal part of the educational system that would be nice to be able to see master's degrees or doctoral programs in this because I think just as much as as any other sub discipline of engineering. It is something that has these directions that are unique in its own right. And I think that's a nice thing to be able to say will happen in the future. There's a an institute that works on crypto economics at the Vienna University, which I and \$Michael Zargham\$ block science are affiliated with. That is already making forays into kind of building up things that are getting closer to degree granting programs. And I think that's something that will also hopefully, as more investment comes through and the benefits are accruing becomes a future focal point. And And finally, I think maybe it would be very useful for the field as a whole to acknowledge the fact that

it's a multidisciplinary environment. And that, of course, partly would come out of this idea of having a degree granting program where you have prerequisites, but I wouldn't say that you would want to source all token engineers in 10 or 15 years from degree granting programs. Quite the contrary, I think we can leverage people who have really good understandings of governance, for example, for the governance surfaces of the of the systems as they change over time, who have you know, outstanding insights into sociology or anthropology or ethnography. These are going to be critical components when you try to understand how a group of individuals who have never met or are decentralized nevertheless, are trying to work toward a particular good of this system and that adoption of the system is a dynamic living entity. I think it's always going to require disciplines that you might not otherwise have thought are important. At the post engineering stage, let's say the maintenance of the system stage. So that kind of acknowledgement, I hope in the future, we're able to see that people take for granted that this is an environment that kind of has a melting pot of different disciplines as opposed to sort of that that narrow track of of a mathematical bent or programming bent for example.

Nathalia Scherer 31:32

And just to clarify, you're looking at governance and more of the social science elements as post token engineering phase, or would you

participant 30 31:45

it's yeah, it's I should not use that as too much as a black and white from before and after. It's certainly an iterative process again, with feedback that once you've created a system if you find that the system itself hasn't allowed for enough inputs to change the system over time, you may need to re engineer it. If you've done your engineering very well, if you're lucky, I suppose. You've already included those little input locations, and maybe they're dormant for most of the time, but then when a question comes up, the circumstances surrounding the initial engineering have changed. If you've allowed those things to suddenly become active, then maybe the the actual system doesn't need to be changed in itself. The structure doesn't need to be changed or re engineered. You're simply applying a governance surface a governance layer or re-parameterization in the existing structure. So again, that would be kind of the question of to use that bridge analogy once again, you know, when you drive over a bridge and it was built during the time of the Romans, do you really need to knock it down and rebuild it in a modern fashion unless there are constraints that are so changed that you must in fact, adopt the architecture engineering again.

Nathalia Scherer 32:55

Now, you mentioned AI briefly in one of your previous answers. And as we see this technology continues to advance. How do you see AI affecting the field of token engineering?

participant 30 33:10

I guess the advantage that I'm seeing now with artificial intelligence is its ability to assimilate a great breadth of information, diversity of information. If we are able to arrive at a series of different design patterns for token engineering problems such that we could in principle, have an

AI assistant, tell us out of all the possible patterns for this problem that we're interested in. This is one subset that's useful. That might be something that would be a worthwhile application. I'll need to jump up just a second let my son and I'll be right back.

That so just to recapitulate or reiterate the the notion of an AI assistant to be able to reduce the design space would certainly help and I think it's more general than just token engineering itself. One of the other directions that might be quite useful is to understand in what conditions you would actually be able to extend a particular engineering solution to incorporate the programmatic definition of the smart contract in a dynamic fashion. And by that I mean having an artificial intelligence that might actually be able to take a look at the system, the state of the environment and adapt a particular smart contract accordingly. might be something that up to the question of whether or not you trust that the AI is doing what you've asked it to do, could alleviate some of those questions of governance where if you want to reimplement a roll out a new smart contract or a new automated programmatic environment, you can allow me to do so.

Nathalia Scherer 35:14

And we're coming close to our final questions. Only a few more. And so \$Livia\$ is bringing up a question about step by step process for token engineering. So we just say that there is one step by step. And so how would you define it?

participant 30 35:37

I think there is I think there is a process that can be that can be placed as a very, very abstract level, and it has to do with viewing the system that you're trying to create as something that you want to have a lens that facets one or another aspect of that system that makes it amenable to testing and finally to construction. And so what I mean by that is to think about the, the goals of a stakeholder or a client in this environment, to understand how the mapping of what they're saying qualitatively into the set of requirements of the system, then informs you of the model that you're attempting to build in that environment. And that in itself, relies upon that that underlying structure of the particular programmatic automation that that smart contract environment that it relies upon the trust of being able to see the system as it is from the point of view of well, I'm not losing myself or my identity by just being able to look into this environment. I can use cryptography to my advantage in that case, to be able to foment trust without actually worrying about whether I'm losing anything in my own context and given that ability to go from requirements. To a specification built around that model. From that point, what you really want to do is to start building into the process, designing for that that safety that I'd mentioned before, within the context of designing for safety. What you're looking for is the ways in which individuals can interact with the system. And what dangers surfaced can interact. We see some environments where people say, Look, I know exactly the kind of individual that will use my product or use this token. Therefore, only focus upon that behavior. That's something that in this particular token engineering process that I'm advocating would be less attractive than saying, no, but your system allows people to do this. Let's look at all of the ways in which the system will evolve conditional upon the fact that anybody can enter into the system freely and do that. So instead of picking a behavior may be cherry picking a behavior that you are sure is going to happen. actually look at the admissible space of actions that can take place and then allow the

system to evolve on the basis of anything that can happen and then say, is the system safe or not? And then of course, it's done through a normally through a combination of analytical results, if you're lucky enough to be able to write down something that would give you a closed form solution that's amenable to analysis. More likely it's going to be a simulation that you create a modeling environment that's implemented in a computational framework, and then analyze the outcomes that come from that. But that analysis then requires the creation of metrics or ways to measure whether the system is in danger or not in danger, and linking those metrics back to what people want, then tells the individuals who have asked for this system whether or not it's doing what they have intended. And so that in essence is a workflow that can be adapted to to any token engineering problem, provided each of those stages can be can be suitably delineated, and I haven't found a system yet where at least just from the experience that I have where you can't do that. But it does, again, require some of these filters to be passed through where people can understand why you're doing it that way.

Nathalia Scherer 39:08

Thank you, thank you for that. Livia, do you have anything to add.

Livia 39:13

Yes, sorry. Just a follow up question. And do you have any process for how to define the metrics? Because I imagine it's quite difficult in such a dynamic system?

participant 30 39:27

Yes, that's a good question. The the metric design is is something that when we pass from the requirements that have been gathered from what people have said they want the system to do through the mathematical specification. Sometimes metrics then suggest themselves for as an example, if we're looking at a market in which we are worried that people's attitude toward risk is is linked to how frequently the price or the quantity of an asset changes. So the volatility if we say, hey, look, volatility may be dangerous because people then feel all this is too risky for me and then they won't join the system. They won't participate in the network, then we might say okay, and natural consideration might be to measure volatility over some timeframe, and then place as a success or failure criteria on top of that, some kind of a goal to say, well, we would like to keep volatility below a certain threshold. And if we do that, then we're linking back to the stakeholders original questions and then they can say, well, we've done demand side analysis in what we think our typical user would like what their risk profile is. And given the particular way that you're phrasing and setting up this metric. We think the threshold for volatility should be x or some number or we could even provide a range of such numbers and then provide the simulation outputs on the basis of that. So in that case, there's a natural kind of path that you go from, people have risk preferences, there's something that causes risk to go up in the system. Let's generate a metric from that that's a fairly clear path to go. more nuanced are things like that idea of you know, it's good for people, it makes people happier, it's, it's going to improve the universe or something of that nature. One of the issues that often comes up is a question of disintermediation, sort of the original intention of of a means of payment, where you didn't need a bank sitting in the middle, to be able to quantify that you could simply say, well, there's the absence of an intermediary, therefore it's better. But that won't necessarily get to you to the

answering the question of will people use it? And so to build out a metric associated with what actually is improved when you don't have an intermediary? What is it you're actually do you want to measure and say that and then ascribe a success criteria to that says, This intermediation is better. Well, then that becomes a question for juggling the different things that you think people care about when they interact with the system. And just as we now see after after many years that it's still pretty difficult to buy a cup of coffee with Bitcoin. We do recognize the fact that there is something latent in that ability to actually utilize that token is as a system of payment itself. That relies upon being able to measure something that when people see that they say, Yes, I will use Bitcoin for for merchant activities, or No, I won't. And that's where we can kind of get into the nuances of what is it that people are looking for, and that stands in contrast to the idea of if you build it, they will come where people would say this is really cool technology. I built this really cool thing now people will simply show up, and you kind of have to take a step back and go no, if you really want the metrics to be able to understand how to measure the success or failure of this of this endeavor. You have to know the individuals who are going to be coming online to participate in this system. Hope that answers your question.

Nathalia Scherer 42:54

Thank you. Thank you. And now as a closing question, we would love to hear if you have people that you admire within the token engineering field like whose work you admire, both in terms of individuals but also could be projects.

participant 30 43:17

I mean, I think there are a lot of amazing people that are that are currently working in this in this field. Certainly my own ability to kind of leverage what I had been working on before as really from a very technical aspect. Initially, it was just about what is blockchain? What does it look like? What does it what are its mathematical structures or its mathematical properties? But turning this into the question of the engineering viewpoint? You know, I'm indebted to \$name\$ the CEO of \$name\$ for kind of pointing me in that direction and saying, Hey, look, you know, there's a lot more that can be done here. And in fact, there's actually a paradigm that we can adopt and create jointly with other people in the community, freely and openly without worrying about things like the gestation time for peer review, or without worrying about the question of whether or not it actually sits well with people. But actually just putting the information out there, generating the output, but then actually just sharing it immediately. That I think is a it's a sea change perspective that I would like to see that not necessarily other organizations adopt, but certainly be able to leverage in the future. So given the fact that I feel that \$name\$ is doing a lot of leadership in this in this environment. That's something that I think is largely under that vision, the auspices of what Zargham has put together. So I have no hesitation whatsoever is highlighting that I think from the the technical aspects and this blending of the things that I quite liked to do looking at the Applied Mathematics side of things and just building things from the math building blocks. Work from \$name\$, I think is also extremely important from his working most likely at metagov these types of modeling frameworks and the questions that are answered the Ask the way in which that is actually being printed. is super clear. So you say, aha, this is what this is designed to do. No, there's no fluff or anything else saying, you know, we're building the next great, amazing thing. It's this is the research question. This is the issue

that I'd like to understand. And then you can see then the mapping out of the thought processes, particularly from the understanding of how you start for one thing, you move one lever, and you get this incredible propagation to a result or conclusion. And so, certainly from the point of view of if you haven't already interviewed, either or both of these definitely would be worthwhile in the future.

Nathalia Scherer 45:34

Thank you. Thank you. So much. Leave your Do you have any other questions to add? Now this was wonderful. Thank you again for joining us, and we are wrapping up the interviews for this study. And, yeah, within the next month, we we plan on on having a draft report to Yeah, and as a participant, you you will absolutely be a part of the first group to receive it. And yeah, we also welcome any questions or considerations you might have for us. Now, in the coming I think,

participant 30 46:20

one just one question. I'm wondering from your point of view, do you feel that you've now that you've seen all the proof you're wrapping up the study or shortly to wrap up the study Do you feel that you achieve convergence in people's responses? Are there? Is there such a wide diversity of the way people approach token engineering that it still seems to be a fuzzy field or do you see that it's starting to come into into focus, regardless of whether or not a degree is what I said, but just in general

Livia 46:46

is definitely a large spectrum of of responses, but in terms of definitions and and practices, I, I would say that there is there i Yeah, I think there is some convergence. Yes. So if we would, I would just say Livia from your perspective. Yeah, I think we're seeing some patterns emerging specially around the definition and practice. I think, understanding I feel like people have been very much in the dark about considering themselves are not an engineer. And I think we've been seeing practices that are similar between many practitioners that perhaps this could be the start of standardization, like you've been talking about and also the term engineering within token engineering has been something interesting for us as like as engineering is Why is engineering so important within token engineering, instead of different terms? Like token economics or token economic design? system design, so there's a lot of nuances that we've been taking the consideration of the analysis.

participant 30 48:12

Great. That's that's, that's great to hear. And I'm looking forward to reading the report because it would be nice to kind of see that that difference between trend and then kind of the spread or the variance around the trend all of these different riffing ways to riff. And I think you're quite right. A lot of what I've said actually could have been couched equally under tokenomics What used to be called token, token economics or tokenomics, but I do feel that now having gone through a lot of the the routine process of the building of these structures that engineering is probably more apt.

Livia 48:45

It was a pleasure to listen to you. Thank you so

participant 30 48:48

much. Pleasure to contribute. So thanks again for the invitation and I look forward to hearing from

Nathalia Scherer 48:54

you Thank you.