(cleaned) Participant 19 and TE Study

Lisa Wocken 0:00
Welcome.

I don't know that we've had the pleasure of meeting yet. My name is Lisa Wolken. And I do a lot of research and education in the DAO ecosystem, on topics like leadership, and then also of course, with the study with token engineering commons, we are looking at that big overarching question of what is token engineering, at least? What are the practices needs and challenges of token engineers right now? So that's our main focus of the study. And we're just so appreciative that you were willing to participate and be a part of contributing to how we advance the field. So thank you.

participant 19 4:22
Well, you're welcome. I mean, I obviously like I care about this thing existing even if it can be sometimes challenging to be. I guess there's lots of different ways to be involved. And I've guess for lack of a better comment, I think, no, I'm still more of a, like independent worker, researcher designer. And so one of the challenges with this ecosystem in particular is that when it first started, there was only like, you know, I don't know, three to seven people who were like arguing about whether the term token engineering even made sense as a term, and like now it's such a big thing that like, you know, I actually sometimes don't know, how is a good way to interact with it, and also to sort of preserve, you know, a relation of just kind of being a researcher and a designer or an engineer, rather than I don't know. Like, there's just a lot.

Lisa Wocken 5:20
Yeah, yeah, yeah, we're I know, you'll have lots of different perspectives to share with us and I already appreciate you tapping into the historical a little bit. Before we kick things off here. Just a couple reminders. The outcome of the study is really a findings report on on the challenges, needs and practices you can omit answers to any questions you can withdraw from the study at any point. We're just excited to have you here for the 45-60 minutes and if you have any questions for us, before we get started, we'll actually hit record and start recording this session so we can dive into our question set but before we begin any questions on your side?

participant 19 6:02
Oh, I don't think so.

Lisa Wocken 6:05
All right, great. Okay. So we'll begin recording recording in progress. And we'll just kick off with the first question, which is if you could share a little bit more about your own personal journey in the field of token?

participant 19 6:21
Sure, I'm going to turn on the video because my daughter is she was asking who's that? So my personal journey Um, okay, so like, I'm a large scale multi agent, control systems engineer. I did my PhD. in system and control in the robotics lab at UPenn. I've been working on sort of

algorithmic policy design in a variety of contexts for a few decades and somewhere in the, I want to say like late 2017, early 2018, there was an ongoing discussion about the absence of engineering ethics and just like engineering, social institutional elements between myself and $name$ and some others floating around the space and my sort of origin story is just that I feel like what I've been doing all along has been the application of algorithm design to various types of organizational resource allocation rules, and such as my PhD thesis was on Distributed Resource Allocation strategies, but I did some industry work on how large corporations spend money on marketing, communications and some other stuff based on data. So I guess what I'm trying to say is, for me, token engineering was a shelling point in the ethics space, not a new technical field like the extent to which we work on designing the automated procedures entrenched within our emerging organizations is awesome, but like the technical acumen is not particularly new. It's the ability to create a, you know, an organizational shelling point or focal point amongst people practicing those skills within the context. of web three that was needed. And so kind of token engineering, in my opinion, exists to bring attention to those ethics and those sort of, you know, design and validation practices that undergird public infrastructures and other sectors. To web three.

Lisa Wocken 8:23
Yeah. Wonderful. Thank you. On that note, I'm wondering if you could share how you currently define token engineering?

participant 19 8:33
That's a good question. I mean, I'm thinking of it as the practice of engineering methods. And within the context of engineering ethics to design tokenized information systems. In particular, that's a subset of information systems. I think tokenized information systems provide sort of powerful, rigid materials for institution building. This is definitely not a definition. It's sort of a waxing philosophic about the definition, but I'm gonna analogize for a second. Like if you're doing structural engineering, and you really focus on like, sort of structures and their ability to stand up you might still be a particular specialists within the context of a larger architecture civil engineering project. And I guess the current state of engineering seems to be very focused on these sort of rigid materials in the form of smart contracts and blockchain networks that undergird, mostly economic and governance rules, in trying to code and particularly rigid code since it seems to be very focused on smart contracts. I'm a little bit more interested personally, in using those rigid materials as scaffolding or skeletons for sort of richer institutional fabrics. So I'm still trying to decide where token engineering falls in terms of is it that you know, materials expertise for the rigid materials and design of systems that useless material specifically, or is there a desire for it to be more holistic in its nature to include the kind of markets and institutions that are made with those tools?

You like to say hi, yeah, I'll say Hi, can you hear me? Well, no, but I can. And this is, yeah, you can say Hi, can you can you say no, she can hear you now you can hear?

Lisa Wocken 10:47
Hi, I'm Lisa. How are you? Uh,

do you know I have a daughter, and she's turning seven soon.

Unknown Speaker 11:00
Yeah,

participant 19 11:01
all right. Are you going to be a token engineer?

I have my headphones back

Lisa Wocken 11:20
No, no, that's totally fine. I have a daughter. She's like the light of my life. So I really appreciate this. Actually. You got to do what you got to do. So yes, I'm curious on building on the definition of engineering, especially as you talk about like the tensions of different opposing ideas about what it could be more about what you see the values are that like are underlaid in the field.

participant 19 11:51
Yeah, sure. I mean, for starters, like reference, I wrote an article several years ago, and I think it's been republished once or twice, including on law, on engineering, basically outlines public like a kind of public accountability and a kind of, sort of, sort of, I should really go back and read it myself, but it basically amounts to putting kind of safety and public interest first, and not necessarily sort of using technology to enrich or benefit oneself, that there's a sort of burden or duty of care associated with engineering systems, which other people sort of transact within or rely upon, especially if those systems are infrastructural or passed through. And extensive users can't reasonably be expected to be the same level of expertise as the people building those systems. So kind of the same way that roads and bridges and other power grids and whatnot. They tend to be kind of invisible in use, especially as they get adopted more widely. That tends to come with a different level of sort of burden of care because you design for and reasonably expect people to consume them without having to individually or independently validate their their safety or integrity.

Lisa Wocken 13:14
Wonderful, thank you. So they would say that token for that other engineering journey, differentiated value proposition Well,

participant 19 13:29
I mean, I guess that depends on what you mean by engineering. For me engineering is sort of be Big E engineering, which is a large social institution that is an envelope in which any sub domain of Big E engineering falls. So whether you're a control systems engineer, mechanical engineer and electrical engineer, civil engineering and environmental engineer, dot, dot, dot, you name it structural engineering mentioned earlier, as long as you're in the envelope of Engineering, then certain extent to which certain kinds of processes and values and ethics are sort of baked into it and there's a expectation of mutual accountability. To those things amongst

members of that social institution. I tend to consider software engineering like a little e engineering because it doesn't fall within that broader you could even call it peer to peer network of people who adhere to that kind of protocol. If you adhere to the big E Engineering protocol, then my aspiration for token engineering would be to specifically be the sub domain of that, that specializes in a particular set of expertise is around web3 tech which was again very much the argument in it in the origination of so I'm not saying that, you know, old ideas that gave birth, the name should have a full claim on future definitions, but I'm essentially describing my part, my memory of conversations about the name and where it came from. Were actually at the time I was advocating for economic systems engineering, given what we were doing, because I think of these largely as systems engineering problems, and trying to convince me that token engineering was an acceptable name by analogy to electrical engineering, which electrons are the units of information that propagate in electrical systems and tokens are the units of information that propagate and a lot of these tokenized systems and so, and actually one could go so far as to argue that any unit of information is in a sense a token. And so you could you know, there are arguments for a relatively generic definition of token engineering, derived from a token as a unit of information or a unit of reference to information. But at the end of the day.

Right. So um, yeah, so I mean, most of the engineering world is, you know, imperfectly subdivided across domains of expertise. It serves as a kind of localization. If you're doing a real project though. You're going to have engineers have a lot of different types, who have expertise in these different areas. And I am personally, you know, a lot of my work was on systems and control, which is the sort of architects make all the parts fit together kind of engineering, and I did see a lot of aspects of that in token engineering, at least as it pertains to these systems using smart contracts and particularly economic logics have a lot in common to control our decision logics, estimation and decision making algorithms as a function of various kinds of inputs or observations.

Lisa Wocken 16:49
Wonderful, thank you. Can you share 's a little bit. A little bit more of what your day to day are your typical use and actually conducting your work. How would you describe

participant 19 17:05
Oh, ah, yeah. So I mean, I guess the first thing you have to do is like break down what works so I mean, unfortunately, my one of my main jobs is as an executive, and so as an engineering executive, I do an obnoxious amount of like writing and reviewing smart contracts doing program management project planning, figuring out how to decompose an entirely too fuzzy defined problem into a set of related and solvable sub problems. This does have a lot to do with what systems engineering is and I strongly recommend a series of videos on on YouTube, about systems and it's about an hour worth of material. So anyway, I won't belabor it, but so I do a lot of this sort of high level systems architecture that involves diagramming, breaking things down, writing high level specifications and functional architectures. And I use a lot of Lucid Chart and hackmds and some other various google suite stuff for breaking things down and budgeting them. But I'm really just dealing like canonical engineering the stuff in that regards when it gets into like actual lower level project work. Once you have a well defined functional architecture

and you're working on a component. It will depend on whether I'm doing sort of an algorithm design problem, which usually has a lot more in common with control theory involves mathematical specifications about what the algorithm is properties are intended to be derivations over a set of algorithms that could be expected to satisfy those properties and deriving the conditions under which those properties can be expected to be upheld. A lot of that work, we developed this thing called the generalized dynamical systems framework for it propagates it takes some of the core concepts that are used in engineering disciplines for numerical systems, and they work on systems with arbitrary data structures. I've written a handful of papers about that. The foundations of generalized dynamical systems paper with jumpseat shortish, or recently one that is submitted but not accepted. Yet on block diagrams for categorical cybernetics and just basically outlines how you do functional decompositions and potentially write formal proofs about properties of algorithms. And again, it's a sort of a generalization of what you would do from a normal control theory algorithmic decision making context. Okay, so that's sort of that's a lot of mathematics work is generally is on whiteboards, notepads and documenting and hackmds and sometimes Latex. But it's it's basically what you do whenever you're trying to design algorithms for a formal setting. If they're simple enough, you might be able to just get back of the envelope and go straight to writing simulation tests or writing software specs. But honestly, if the problems are that level of difficulty, then you're probably not doing engineering at that point. You're just moving straight into construction. But at the at the engineering phase, you're really focused on gathering requirements, identifying the stakeholders, understanding the decisions that are available to you, fleshing out a design space and then evaluating the trade offs present in that design space and exploring the family of designs that are plausible and then ideally working with stakeholders. To determine where in that trade off space an organization wants to be. If you're dealing with systems that can have explicit parameterizations. A lot of the times you want to have those explicit parameterizations into your designs, so that there's a governance surface that can later be exercised by those stakeholders to change the point within its configuration space that that community wants. But again, like I'm coming at this very much from like an actual engineering standpoint, so I don't see very much of that happening in the space and my attempts to teach it have been fraught because I very rarely encountered people with enough formal technical training in the methods or an engineering to even impart a lot of that, because it's, it's a lot very much procedural. It's like, Hey, these are the steps. These are the things that you take on in the context of those steps. And the exact way it manifests depends on what you're designing, but there's a sort of like meta process that you apply to doing sort of rigorous sort of stakeholder driven design in any sort of, you know, civil engineering. So I do a lot of that.

Lisa Wocken 21:48
Just a follow up on that, based on what you do see happening in the field. I'm not quite following this, like procedural methodology as much. What would you wish for in this? Would you wish that it would be more what you just described, or is it? Yeah,

participant 19 22:08
I would just name it differently. I think if you're doing a sort of move fast break things trial and error model, then you're not doing engineering in the big E sense. You can still do that trial and

error thing, but you have to sandbox it. So part of the reason that I say that I do research and design is because research can involve some degree of sandbox trial and error, but you're not putting those things into public consumption. You have to make a very strong distinction between a research project where you're trying a thing out to learn and like a public work, which is I built this thing for people to use and we don't see a strong distinction between those behaviors and I consider that to be vaguely problematic. I think it's like concretely problematic, I think you'd have a much better time developing a trusted relationship with the outside world. But it's weird because there's a perverse incentive in web three like the web three world is so move fast and break things. There's so much drawn from the Silicon Valley engineering, little e software engineering product development methodology, as opposed to the sort of Big E civil engineering methodology that you you're locally expected to be very fast and break things. But if you wanted to develop rapport with a world beyond just the current sort of web3 ecosystem, I would recommend leaning into the kind of professionalization that comes with developing highly expert skills around a particular set of materials, understanding what contexts those materials are good for, what contexts are not good for, and figuring out how to apply them in those contexts to create reliable ends for your stakeholders without requiring your stakeholders to understand all the details. In the sense the engineering profession mediates the application of complex technologies for the benefit of society.

Lisa Wocken 23:59
Wonderful, thank you. Is there anything else just before we move on from tools at all that you haven't shared already that you'd like to share? Oh, sure. I

participant 19 24:11
mean, like practically speaking. You know, if you're doing token engineering, you should probably be using some sorts of simulation tools. If you're doing some like initial brainstorming or trial and error. There's nothing wrong with using an Excel sheet or like a GUI based tool like $machinations$. I used to use stella architects when I was younger, to rapid prototype things. And I think there's a decent amount of that. There's a lot of people who I think prefer to use GUI based tools. They don't tend to be particularly good for like scientific exploration. They're better for like, you know, kind of computational thought experiment, trial and error. Once you get a sense of what you want. I tend to recommend taking time to write actual like, I call them scientific computing simulations, you can look at the kind of work that $name$ does in his background in atmospheric physics, physics, you got to build like a model of the world documented, understand its assumptions, challenge and push the boundaries of those assumptions and evaluate the potential outcomes under a wide range of circumstances, including pushing things till they break, because if you don't actually push your model until you find its edges, you really don't understand it yet. So I guess that's a place where we use $CAD CAD$, but you can also, you know, write simulations in any language I've seen people write rust simulations are done quite fast. But at the end of the day, it's less about the specific programming tool and more about this skill or, you know, the abstract tool, which is like scientific computing. And so you'll see scientific computing all across science and engineering. And I think the web three world is again, looking for a kind of, you know, plug and play thing that just doesn't like to some extent can't exist like that. What you actually get are primitives. You get

things like NumPy$ and $Scipy$ and $SciKit learn$ and $CADCAD$ even and these are different tools that provide some of the functionalities and make it faster and easier to do computational science. But at the end of the day, the science is the tool. And so you actually have to do the computational science in order to get the benefit of it. You're never going to be able to just like export that to a tool

Lisa Wocken 26:22
which areas of knowledge and you've already touched on this a little bit, but which areas of knowledge do you consider essential for the token engineering? Yeah,

participant 19 26:32
so I think that depending on how you define it, like if you go narrow where a lot of people are trying to do mechanism design and market design work, you really need to learn some dynamical systems theory, understand how to write proofs and just generally get past the sort of idea that the mathematics is like not important. I feel like a lot of people don't necessarily appreciate mathematics. So I'm going to be kind of a like you need to know linear algebra you need to know some basic dynamical systems. You need to understand how how systems with open inputs can still exhibit properties and like kind of work through this like basic literacy in the way in which like short term action resolves into long term properties, because, you know, people use agent based models a lot. They're nice, they tell good stories. They're not particularly scientific. They're very good at storytelling, with some coercion you can get them to, to work within a scientific purview, and we do use them sometimes. But I strongly emphasize some, again, more, like more rigorous methods that involve testing much wide ranges of potential action sequences, independent of the why, because you really don't have control. Over why. So this kind of gets us into economics, behavioral economics, institutional economics. I think that it's very good to understand behavioral economics and to use behavioral models to inform scenario generation within your computational science, but using that as a like, it's, it's more like it's necessary, not sufficient. So having a good sense of the behavioral implications of a mechanism design is important. But if you lean too heavily on that, then when your behavioral assumptions are wrong, your whole thing is going to fall down. You need to be able to build things that will work even when a lot of your assumptions turn out to be false.

Lisa Wocken 28:36
Great, thank you. We're gonna move on to challenges and needs. And I'm curious what challenges you've personally faced in the field of token engineering and then the follow up to this will be what challenges do you think the field faces at large? Um, well,

participant 19 28:53
I'll say I think that might be the same. I see a relative like, it's just a very young field. You know, I think it's great that there's a field emerging, I was probably naive in how quickly it might mature I think I imagined a world where a lot of experienced engineers would get involved and then we would have for for free so we would sort of as a community would get for free a lot of the you know, methods, tools, ethics, etc, etc. That professionalization in general that's kind of in engineering disciplines. In practice, what what we got was probably what I should have

expected from my time working in leading data science teams was a lot of aspirations people who were excited by interested in the field but like a much lower percentage of people who are coming. With the experience already, though, there were you know, there were people who did, but the incentives for those people were to just go do the work. They didn't have a great incentive to engage with the token engineering. community because the token engineering community was I don't mean this disparagingly, but kind of needy, like lots of people who wanted to know, tomorrow, what It took other people many years to develop in terms of capabilities, and a relatively low tolerance for the idea that actually you learn by just like working for a while and being willing to be you know, not the primary person being an apprentice and working on projects in with smaller scope under your control and then learning and leveling up and very old sort of Guildish model but even professional engineering as it exists today follows a version of that model, where you get, you know, an under you get a accredited engineering engineering undergraduate degree, you pass some sort of qualifying exam, you go into a job that's, you know, for a more junior engineer after a certain period of time you get to sort of sign off to take a professional engineering degree, and then there's the licensure program and I'm not saying you should replicate that exactly. But it's, it's it's laying over something. So that that that is a it is a manifestation of a particularly necessary process, which is to develop skills over time, both through academic knowledge and practice. And so just understanding that there's a learning arc there. That's something that I think there'll be a lot of benefit to. I do think it's improving, but it's slow. I mean, the token Engineering Academy is a good step forward, but it's still basically like, kind of intro level courses as an undergrad. There's a need for people to get practical experience, but not just ad hoc. Practical experience, like practical experience in projects, where the where the engineering processes are being applied, and where there are people to kind of help them learn the various methods and tools etc. And again, I'm you know, maybe being somewhat I don't know, conservative in that, like, my expectation is that in order for token engineering, to be engineering, it should be conforming to this sort of engineering quote, unquote, protocol as it were, and that these elements I'm describing are part of the protocol spec. So like, we can do them or not do them but if we don't do them, then what we're doing is not engineering.

Lisa Wocken 32:27
And given that what would you say are the most pressing needs in engineering field currently?

participant 19 32:35
So I guess the question is, field is a difficult thing to totally pin down. I would say for people who are aspiring token engineers, they need to continue development of educational material at more advanced levels. They need access to projects where they can serve as you know junior engineers and develop skills with with yes with people who are willing and able to teach them and to have the time to do that, because there's some incentive issues there. It does make projects sometimes longer and harder to support junior engineers. It doesn't always make it easier. The but that's from the perspective of the kind of group from the perspective of the more professionalized teams they probably need more help building a reputation for the field as something that is professionalized so that entities can a be willing to, you know, listen, when they say, Hey, that's not gonna work, or say, hey, you know, it's bigger than just that like little

thing. It's connected to these four other parts. And if you don't do this part, well, considering those other parts, then your things probably gonna fall down. And like there's just a lot of aspects of professionalization that fill important societal roles, in part in terms of checking the behavior of other actors. It's my personal opinion that, you know, in a healthy, expert economy, there's going to be people with social influence and people with money and that it's the job of the technical experts, engineers to check those people when they're, like in the sense of checks and balances, when they're pushing for things that might be unhealthy. or unsafe, even if those people don't realize.

Lisa Wocken 34:16
Right, thank you. We're gonna shift to some questions that go a little bit deeper on certain segments. And the first of which is I'm wondering how you can describe or how you would describe the role of ethics in token engineering.

participant 19 34:32
Sure so um, so here's the thing like ethics is kind of a trap word in a lot of circumstances. It can be used as a it can be politicized to the point that it's counterproductive. The reason I like engineering ethics as a specific kinds of ethics is because it's like a practical professional ethics. It's, it's not designed to prevent you from getting things done. So it's not being used as a blocker like sometimes AI ethics stuff is like, Hey, don't do that doesn't provide any meaningful you know? path forward. And then there are other circumstances where ethics is basically a philosophical discourse on ethics is very different from a practical discourse on ethics. And so I wrote the piece I did about engineering ethics and tied them back to like a long history of building stuff, because the idea isn't to use ethics. Either to sort of underwrite or impede anything in particular, it's about enshrining the sort of, again, this duty of care or this, you know, relationship between people who design and build and monitor and maintain and to some extent govern technical infrastructures on behalf of the stakeholders who are subjected to those. That's tricky, right? Because I'm not sure how much this has become the case in the token engineering community discourse, but the emphasis on it was it was originally there to make sure that we could differentiate token engineering from something like crypto economics, where crypto economics I associate with the economics discipline, which is primarily made up of a kind of very reductionist model used to inform policymaking and for which you can never really prove it right or wrong, or determine whether or not it's uncountable in any way to an outcome. Or even if you think you can, no one would ever agree like this. There's a fundamental distancing of accountability in the profession of economics that sort of comes from the nature of the models and the way in which they feed into political processes. And decisions. And as we shift to things like web three technologies, where the decisions are literally automated into the infrastructures, I think that they should be treated as civil engineering problems and thus the appropriate form of ethics and accountability for what people do. Should be applied. That's a little tricky, because there's a question of accountable to whom not a huge fan of some of the I'll call them illiberal regulatory dynamics that are in like the US markets. But I do think that there's a opportunity and historically a very real self regulation amongst expert professionals in terms of what is quality of work and what does it mean to uphold a duty of care and the extent to which that is foregrounded, you can also reasonably demand the compensation that's necessary to spend

the time to uphold that duty of care, which is where the rubber meets the road here is because you can't get it for free. Like it takes a lot of time and effort to actually, you know, give a fuck about stakeholders and take the time to understand context and come up with solutions that are appropriate to context with considerations for potential harms and mitigate those harms. And so we very rarely have the budgets to do that. And so you, you know, you only really get that in settings where the demand side, the payer side agrees that that's also important and is willing to pay the cost of doing the work to uphold that duty of care. And so I think there's a lot there. That's just part of why I think of this as a relatively immature field, because it's still in its, you know, I'll say predominantly amateur phase, and the marker of it being more professionalized will be when it's sort of a given on both the side of the supply side, the people doing the work. And the demand side, the people chartering the work, that this duty of care is present and needs to be paid for.

Lisa Wocken 38:30
Wonderful on that note, one of the next segments to drop into is finances. So I think we go there right now, since we're already, you know, headed that direction. I'm curious if you could share what are the incentives and rewards to being a practicing token engineer

participant 19 38:49
almost none. Mmm, that sounds harsh. But I mean, that's the going back to what I was just saying. Like, I imagine a future where being a member of that quote, unquote, peer to peer network of recognized token engineers comes with it affordances both from your peers and from those who would contract you but that's a social institution thing, like the community has not achieved that status and that's the primary incentive. There's, there's nothing in being a token engineer, that provides me a benefit, really, in fact, even so far as we use the term, sometimes I have to walk it back because it sets expectations that I don't like when I'm in some cases now. That's not to say that it's it's a problem are bad or people shouldn't do it. But you think it's incumbent upon that community to define its identity and to create and maintain that identity in such a way the brand identity in such a way that it actually is an affordance to its members, and today, I think it's scarcely distinguishable. From a variety of other buzzwords within the web three space.

Lisa Wocken 39:58
One question we're asking everyone is what what would you say a typical salary range is for token engineer.

participant 19 40:07
I think that strongly depends on on. What what a particular employer puts under that headache? I think most people who are token engineers are freelancers and so they probably have really erratic compensation. I would say that like a an expert engineer in a traditional setting, that is on the say, not at like a partner level within an engineering firm might make 80 to 120. If you're moving into sort of data science and data engineering, a more or a more experienced person might make 150k a year but again, you're talking about environments where people have reliable access to work, and that they're getting paid. You know, they're getting paid out of the

revenue that's being generated by a client services firm, a professional services firm, and like I don't see much of that in token engineering. At all. And so even insofar as like I run a firm that has, you know, people who wouldn't list under their potential many relevant qualifications token engineer, I don't think token engineering is the defining characteristic I mean, $name$ is a token engineer, but he's also just an incredible computational scientist. And he does a lot of computational science, and sort of algorithmic policy design and testing work. Similarly, like $name$ has a has a PhD from Carnegie Mellon in economics, and he worked on mechanism design and market design and is you know, extremely expert in control theory. And so if I were to really ask what the dominant attributes of his expertise that would underwrite, you know, a set salary at like a partner level at a professional services firm, it wouldn't be called token engineer that defined that it would be his expertise in behavioral, you know, basically mechanism design, behavioral analysis, institutional economics and control theory. If we were to call that token engineering, then sure. Well, like I don't most people who would call themselves token engineers don't have even like a third of the capabilities that Jamshid has. So that's where the part of the challenge comes in. I'm like, I can tell you that like we pay engineers as much as we reasonably can while remaining, you know, solvent as an engineering firm, we have a mostly Co Op model, like working on some legal entity transitions. So we also basically disperse if we have extra profits, we disperse them as bonuses to the team. And people do pretty well. But like, again, I have a hard I have a hard time associating that to token engineering because of the breadth of work we do. I mean, like we've done machine learning projects, even the gitcoin stuff that we did a couple years ago was almost entirely build a a, not just build a machine learning model, but build an organization a sub organization capable of continuously operating and maintaining a machine learning model that filled a particular function within a larger ecosystem. Like I would argue that actually by comparison to that same kind of solutions architect role in kind of a Silicon Valley sort of web two setting people are making on the order of a third to a quarter of what their what the base salaries for the same skills are. So in my opinion, you really shouldn't be working in this space. If you are in it for comp, because you can if you actually develop the skills, then you'll have opportunities that pay significantly more elsewhere.

Lisa Wocken 43:53
Wonderful, thank you. Next question. Do you have thoughts on how to increase diversity and inclusion within the token engineering field?

participant 19 44:02
Um, yeah, so I think given the relatively like, early stage of the organization, we could focus top of funnel because I don't think there's anybody who can't learn this stuff, if they're willing to put in the time and effort to develop the skills and so the best place to increase diversity is as high in the funnel as you can get encouraged people maybe put effort into sort of mentoring and educating and developing a diverse group of you know, even if they're beginners or, you know, whatever level and the more that that body of token engineers is diverse, you know, gender, race, geography, etc. The more likely that they will also find and encourage more people who share their gender, race, geography, etc. At least hopefully. And so yeah, you know, I know that's maybe seems like overly mechanistic, but, you know, there's a lot of path dependence in diversity, it can be very difficult to create diversity in a non diverse organization. But you get this

benefit when the organization is very young, for sort of setting its initial conditions better by really investing top of funnel and getting a more diverse bases of engineers.

Lisa Wocken 45:21
Wonderful, thank you.

Okay, we're gonna shift to the future for these last couple of questions. What do you wish for the future of the field? And how do you see the field in the next three years?

participant 19 45:34
Um, yeah, so I think I'm gonna tag me on to the diversity question. I'd like to see it be a very diverse, particularly geographically, obviously, gender and race as well, but I think geographically goes a really long way. To help build systems that actually are not say, you know, global, North centric, etc. Like there's a I think that's actually a very material dimension of diversity that's underrepresented within, you know, tech systems period. So if we want to build you know, social, financial, economic, you know, governance infrastructures using that that are capable of serving communities that are all over the world, then you really gotta get engineers from all over the world. I think that this degree of professionalization is something to strive for. I don't know that it's a three to five year thing, but I'd like to see it incorporated in the vision for the organization. Because in particular, I do think that's the only thing that differentiates it from all of the other fuck around and find out stuff that goes on in web three. I think there's a really great opportunity to learn from other people's fuck around and find outing and then to consolidate that knowledge into sort of a rigorous publicly accountable engineering discipline that fits within this broader you know, social institution or engineering protocol, whereby the people who are recognized as token engineers can reasonably be trusted to produce things that don't fall down. And insofar as they do fall down people who are, you know, willing and able to accept some degree of accountability for that. And I do I want to caveat that a little bit because given how frontier the spaces, there's just so many ways in which you can account for something falling down, but you could, at the very least, being strong guarantees about certain modalities of failure. You can say, like, look, this stands up to this and this and this, but it breaks down under that and that and that, and we can't prevent that in that in that from happening, but we can tell you in advance that this thing will break under that and that and that. So if you see that and that and that coming, like consider moving off of this.

Lisa Wocken 47:49
Yeah, yeah. Wonderful. Thank you. Um, anything else you'd want to share by way of specific developments or innovations in the next three to five years?

participant 19 48:00
I mean, for my part, I'm still very deep in developing methods. I would like to have finished the series of papers on generalized dynamical systems with a Jamsheed. We should have a new version of CAD CAD out that's based much more closely on the formal mathematical developments. We should have, hopefully a significantly larger amount of publications on the like, how to think about engineering organizations or institutions, more clarity about the fact that

web three tools are not the only emerging institutional materials. I do think that the use of AI within institutional systems is really important. Both blockchain smart contract stuff and AI ml stuff share the same sort of core concept of automation and automation used to administrate facilitate or decide with and on behalf of humans. And so integrating those technologies into holistic systems will mean that we need engineers with expertise in the web three tools and in the AI tools and in you know, institutional design institutional economics coming together to create you know, emerging institutions that actually fulfill their functions in society, even if it's just a little bit at a time. I see a lot of promise there but I'm still talking about you know, when I get get that far down, I'm thinking many years in the future and the aspirations that I have for how the way in which emerging technologies can contribute to building operating maintain and governing, sort of healthy infrastructures and institutions that maintain those infrastructures.

Lisa Wocken 49:44
Wonderful. Could you just we've had a number of people bring up AI and so I'm curious. Could you share a little bit more about your perspective of how you see AI impacting the work of token engineering?

participant 19 49:56
Sure. I mean, for starters, on name side, we already built an internal POC of a basically a specially trained version of the chat GPT bot that's got a bunch of our own internal documentation as its training corpus. We've been experimenting with the extent to which it's safe to use it as part of our workflows. I've likened it to having, you know, a junior staff like role It doesn't replace junior staff, but it might shift the ratio of junior staff to senior staff in the sense that I think it's like probably four to six hours of more junior staff per hour of more senior staff in a partner level staff in most professional services firms view have an adequately trained LLM system that's capable of distilling expert knowledge contextually, then you could potentially half the the amount of more junior staff time you need per senior staff time, which in turn results in I would think actually healthier relationships between partner level or as a kind of junior and senior level staff. Because you have less of a churn dynamic, as long as you need, you know, four to six times as much time from you know, more junior staff and from partners, then you're gonna have to assume that you know, only about a quarter, maybe a fifth of your, your more junior staff can ever really get to the level of a partner they'd have to turn out, which doesn't really create incentives to sort of really invest in people. It creates incentives for people to sort of like push people really hard and see who survives and that's not particularly socially helpful, healthy and so actually see lots of good stuff there. Um, the other thing is like AI isn't just algorithms, right? Think technically speaking, AI is a sort of offshoot of the sort of interdisciplinary research that was cybernetics in the 40s He has a great story about you know how some of the researchers really didn't like the guy who coined the term cybernetics and they were just like, No, we're gonna go do our own thing and use our own name and kind of like you know, not hang out with him. Good old fashioned fork. And then you get the the development of a wide range. of sort of initially like biologically motivated or biologically inspired, algorithmic or even in some cases, just like circuit systems, but, you know, moving into early computation and like, building things like the perceptron, which is like the original neural network, yada yada. There's like a huge, long legacy. In fact, I think if people had actually, studied AI, they'd see a lot

of overlap with what we're doing in the web three automation stuff, because at the end of the day, we have a lot of actuators like points of action in a sense of individuals and smart contracts, lots of sensors in the sense of places data comes from, and we have algorithms that sort of ingest and effectively assimilate the information that comes from all of those data sources into some sort of, you know, belief and or action which is then imposed upon the world and that type of archetype is present in most artificial intelligence systems. And so, you know, whether it's a machine learning system that's doing mostly linear algebra, but based on large sets of data supervised or unsupervised, like there's a whole there's a whole lot of overlap. So really, what I'm saying is if people are using the term AI in a big like, Lala way, then that's probably not healthy. If they go take the time to sort of absorb both some of the history and some of the technology. You'll find lots of places where there are similarities, but also places where there are differences that render them complimentary, pursuing the same kind of goals.

Lisa Wocken 53:40
Wonderful, thank you. Appreciate it. I'm so the last question that we really have here. And I know we just have three minutes left, but whose work do you admire in the space and if there's anybody you'd recommend that we ensure we interview we'd love to hear those recommendations as well but whose work do you admire in this space?

participant 19 54:02
Good question. Um, I will say that I mean, obviously since the kind of beginning of this discourse, I follow $name$'s work and had conversations with him here and there in the sort of, within the corpus, you know, quote, unquote, token engineering. People who I really appreciate include $ name$ I think he's really like, galvanized people to to learn and develop skills. And you know, has, has skills himself as an educator, I really, really adore $name$. I think he has really committed to making both developing skills and then teaching other people. I think he stands out as somebody who should be both learned from and two demonstrates what's what it means to be like, here's a cool thing I don't know about now I know about it. Now I'm teaching you about it. I would love to have more people doing that. Because I think if we had a community that really did a lot of that, we would both develop the skills and ideally some of that professionalization much more rapidly as a community.

Lisa Wocken 55:19
Great, wonderful. With that being said, Do you have any questions of us before we share kind of next steps and close out

participant 19 55:27
um, let me think also, I want to maybe throw in one or two more people because I'm just like, that I hadn't prepared. So those are the first two that came to mind. The other person who I think definitely needs outreach, even if they haven't been super active in the community is $name$. I know some of the work that she's done with her book continuing to update it, the token economy book and including in it some of the core concepts. We discussed visa vie token engineering. I also think it's worth I don't know if you know, $name$, she works with me pretty closely. She's an infrastructure. She's a PhD on infrastructure studies at RMIT worked with $name$, and she's

been working closely with me for the for a while she recently hired her about a year ago. But I think her complementarity sort of perspectives coming from more like the SDS, the Science, Technology and Society sort of infrastructure studies side does a reasonably good job complementing and sort of balancing out engineering perspective She, sometimes gives me grief about you know, straying into the like the the technocracy range and I do think that there's an important balance between sort of technical experts making decisions that you need to be a technical expert to make and community members and stakeholders being incorporated into setting policy agendas, determining goals, identifying prioritizations amongst conflicting goals, and like managing that like, difficult dichotomy between expertise and inclusion. And I really appreciate the fact that coming from infrastructure studies background that that kind of $name is able to kind of like poke at that a little bit and try to understand it better. She also writes and talks about things like self interest structuring, which includes the circumstances under which you provision your own infrastructure. Though potentially at you know, financial or administrative costs, but the degrees of autonomy that are produced when you're in as an individual or as a community, you take on the burden of providing your own infrastructure, rather than relying on infrastructures that other people provide for you. Because when someone provides infrastructure for you, you are giving them at least some modicum of control over you. Hence, this whole burden of care because there's a big difference between taking that relationship as a, you know, a thing that provides an ethical obligation to service and taking that as an opportunity to exploit.

Lisa Wocken 58:12
wonderful. This has been exceptionally helpful. Of course, if you think of any other thoughts or have any other questions, please do not hesitate to reach out to us. And you know, again, I'm Lisa Wolken. And Livia from token engineering Commons we're available to during this time. If we have any additional follow up questions. Do you mind if we reach out Would that be okay?

participant 19 58:38
No, that's fine. I might. I mean, My only caveat being I can be really slow to respond. I'm currently like basically trying to be a you know, I'm working as an engineer. I'm like helping manage an engineering firm. I'm on the board of meta gov. And I'm dadding like so much. I'm working on getting a Data Trust. It's actually formed now but we're building out the infrastructure for this data trust for a hedge fund. As part of our like, it's a hedge fund is the commercialiser. There's a data company that does the actual data mining and then there's this data trust that's responsible for kind of representing and administrating the interests of the data contributors visa vie, the tech company and the hedge fund to make sure that there's like not exploitation and that's also just like a huge thing and so I yeah, I realize it's an hour is not really enough to talk about all the things but I'm, I'm very excited that

Lisa Wocken 59:37
and yet it is I don't anticipate we'll we'll be reaching out and I My hope is actually that we spend the next few weeks wrapping up the interviews, we go into analysis phase and the time we're reaching out is really just to give you a findings report and to hear your feedback and get your

insights at that point if you have things you want to share. So truly, truly just, you have that makes sense. I think things going on and we're we feel so honored and excited that you've given us an hour. So thank you.

participant 19 1:00:05
I have one more comment. Then you talk to Kelsey, if you talk to Kelsey, you should also ask her about mapping and analysis methodologies because she's an ethnographer by formal training. That's what the kind of research did for a PhD. And it sounds like you guys are doing a great job or whatever I'm not trying to impose but like, given that the nature of the research you're doing is in the domain that her formal studies were in. I think she might be able to speak to how one can and should go about that as part of a token engineering practice. Because going back to the discussion earlier, engineering in the Big E sense does include this degree of accountability and that includes actually asking people and listening to them and talking to them. And so doing that, in my mind is actually still within this envelope of engineering. And I think it's underrepresented within the ecosystem pretty broadly.

Lisa Wocken 1:00:58
I love that I will probably put my name in the hat. My PhD is in organizational leadership, but I specialized in grounded theory methodology. And so to talk to an ethnographer and somebody who really understands that space of the importance of it i That's the only web3 through research I want to do right now because everything's so emergent. That grounded theory ethnography, like that's where we need to be is not the best practices, but the best for now practices and the cultural timestamp. And so, I'm just like, thrilled that you've given us so many great leads and names and also that you yourself are somebody who's clearly advancing the thinking in the space multiple of our participants already have referenced you as somebody whose work that they really admire and that they really look to so I've been looking forward to this interview and thank you so much. Thank you.

participant 19 1:01:46
about the baby intervention thing. And I realize we're five over so I should let you go.

Lisa Wocken 1:01:51
Yeah, yeah, thank you for your time and have a great rest of your day. Thank you See ya.