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Mon, Jun 05, 2023 5:05PM • 57:30

SUMMARY KEYWORDS
engineering, token, te, great, math, questions, perspective, talked, challenge, cryptocurrency, structure, clear, research, people, making, field, strong, traditional, practice, started

SPEAKERS
Nathalia Scherer, Participant 17, Livia

Participant 17 00:03
Hello, can you hear me?
Livia 00:06
Yes. so good to see you.
Participant 17 00:17
Where are you right now?
Livia 00:20
Can Okay, can you can you hear me? Well?
Participant 17 00:24
Yes, I can hear you.
Livia 00:26
Okay, great. I'm in Egypt right now and nath lives in Brazil.
Participant 17 00:35
Oh, that's cool.
Nathalia Scherer 00:38
Good to see you. I think I think we've crossed paths at like $name$ some years ago. So good to see.
Participant 17 00:47
Good to see you too. Nice to meet you again.
Livia 00:53
Thank you so much for joining us for participating nurse buddy. Thanks for making the time for this. It's so important for us to have your perspective. And just as a reminder that we're trying to bring more definitions a better definition for token engineering and also unearth the challenges and needs for the field to advance. So I'll be conducting our interview and Natalia will be taking notes and she will turn the video off so you don't get distracted on where to look. And you're welcome to withdraw from the study at any point and to omit any questions and we're going to start recording it thank you have it nice you can you start recording in progress. Thank you. Do you have any questions before we start? No, nothing relevant to the study. So I'm ready. Great. So it should take around 45 to 60 minutes. And can we start with your personal journey so could you share a little bit about how you got involved in your field of work?
Participant 17 02:29
Oh, you mean maths, or cryptocurrency or both? Um,
Livia 02:37
yeah, perhaps both the intersection of wherever you want to start.
Participant 17 02:42
Yeah, I am a challenge to myself because I sometimes have mental health struggles and one thing I've recognized is that sometimes it's good to back off but there are other times where I need to give myself something hard to do to provide a quest that helps me so initially, I just wanted to take calculus because I had not been a math person. And I thought taking calculus would be a great challenge and I discovered I really liked math. Especially when it wasn't just like a list of rules and formulas, but it was more of an experiential journey. So I just never left it and I stayed in it until I got my PhD and then I worked as a professor for seven years after that. And was tenured, really liked the focus on simplifying information and diversifying the representations of information. I got into cryptocurrency in summer of 2014. I saw an advertisement in a magazine where someone was quoting a price in US dollars and Bitcoin. So I got curious about what Bitcoin was and for a while I was really active in keeping up with the research and then when my when my first child was born in fall of 2016 it gradually kept more and more attention away. So about 2020 I got back into it more actively and then discovered the $name$ very randomly at the beginning of 2021. And worked with $name$ on some data analysis and worked with $name$ on some research related to $name$ and $pool optimizations$ for $name$ or $namer$ or someone and then kind of for like a year and a half from mid 2021 to 2023. I was saying yes to everything that crossed my plate, which was fun, but also really

draining. And so for the past few months I've been barely doing anything just trying to recover and refind some joy in the things I do. Right now I'm working 10 hours a week paid and I'm not I'm trying to not do much more than

Livia 05:22

I'm glad you're you're taking care of that. And as our overarching question is, how would you define token engineering?

Participant 17 05:33

Um, so I think token engineering probably is best viewed as like an analog of software engineering. So, and it's the question of how to design a system that utilizes tokens to achieve its objectives, where your tokens are cryptocurrency or blockchain tradable, or blockchain recorded assets.

Livia 06:02

Do you think there's a step by step to the token engineering practice?

Participant 17 06:08

Is there a step by step to the token engineering practice? I think there are best practices that are incorporated in token engineering. I like to think there is a step by step process. But that might be a function of my personality. I like to know what's going to happen. And so I like clear plans.

Nathalia Scherer 06:52

what would you say in your perspective is a linearity you'd like to go with?

Participant 17 06:58

Um, so I would say at the beginning, understanding the problem at a high level, breaking it down into smaller questions that need to be answered and I guess I would, I guess to one thing that might be important is to distinguish token engineering research from token engineering work. Because they're related but they're not the same. Like a lot of what gets published or has gotten published in the past as token engineering was demonstrating that a system could work. And there's the separate question of what does building the system actually look like? So get back to the question on process understanding objectives at a high level being able to map those to specific objectives that can be delineated as, yes, this was achieved and no, this was not achieved, I guess requirements gathering, kind of the classical and then working through the research and the production to make sure that the requirements are met, and then going into production now within those like research as a process. I don't have a good I've never been able to do research as a step by step process because things always pop up. But that would be the general I mean, the three Ds the Discover, design, deploy is a good pattern to follow, I think.

Livia 08:37

Thanks. Yeah, can you share even though you're taking a break now and having less responsibilities, could you share a bit about your daily work routine? What are some examples of typical tasks, rituals, processes that you use?

Participant 17 08:55

Yeah, I so I work 23 hours a week. And 10 of that is paid by a client and the other 13 is just me. Doing what I think is fun like this. This is part of the 13. So the main things I do are write code. Write math and descriptions of math. Have conversations with people, including clients and run experiments and record results from the experiments trying to think and also I do my own knowledge, increasing work of reading papers and reading Twitter and just making sure that kind of doing some foraging every day.

Livia 09:51

This is a personal curiosity. But I've been hearing many interviewees say how math is very important for the token engineering process. And I don't think we have talked to a mathematician like you before, and I wanted to understand in your perspective, why were where does math comes in, in the token engineering process? Why is math so important?

Participant 17 10:18

I think math has a language of structure and metaphor. So I think the temptation is to over quantify modeling and I think that that's kind of a rabbit hole that I got sucked down. But I think the benefit of math is in providing clear and unambiguous descriptions of structure. So even without having any numbers attached to anything, having a clear picture of what goes where and when. Math is a good language for that. And also there are many problems that pop up that already have descriptions. For instance, voting theory, like there's a lot of governance research and people have been thinking about voting systems mathematically, you know, for 90 years or so. So starting with some of that background knowledge and just the way that people have thought about it, not so much about the formulas but about clear descriptions of exactly what is happening if we can't, if it can't be clearly described, then that's a problem and math is one way of clearly describing things. Also, I think it provides the connection between these different representations.

Nathalia Scherer 12:08

Yeah, he froze for me as well. Okay. Thank you so it stopped on. You were talking about the math practice. I think you covered a good deal of it. Was there anything you wanted to add?

Participant 17 16:32

Yeah, I think I do think that there are two types of ways that math helps. And one is the actual, like, oh, there's this practice of convex optimization or whatever the thing is, that's helpful to look at a given problem. But I think there's also a way that I

think there are ways of using math and thinking through math that a person doesn't necessarily have to be a heavy like a heavy symbolic expert to benefit from. And I guess my hope would be that we can figure out how to communicate more of those big picture ideas, so that people aren't siloed from conversations

Livia 17:24
and which areas of knowledge do you consider essential for the token engineering field?

Participant 17 17:44
Thinking things and making things more efficient and also being able to think through being able to ask lots of good questions and to sort of I think one needs imagination and logic. Those can show up in different ways. So I guess those aren't really which areas of knowledge do I consider? Essential? Yeah, I think familiarity with some type of modeling. It doesn't necessarily have to be mathematical modeling. But I think the most important skill is communication. And to to oneself and to others, colleagues and clients.

Livia 18:49
Yeah, that's great. We've been having we've been hearing a lot the need for clear communication. Can you give two examples of polar opposites token engineering projects that you've been involved with? Projects and approaches?
19:07
Can I give examples of projects I've been involved with?

Livia 19:11
of two polar opposite projects. So Oh, two projects to have distinct approaches.

Participant 17 19:22
Yes, so in general when I worked with $name financial$, I would say that the structure was extremely agile and very responsive to new inputs and new ideas. And it's sort of like it placed a premium on like as you think and process information quickly, and I would contrast that with a more planned out structured approach where the requirements were unlikely to change once the project had started. Neither one is better, but they were definitely distinct. And I think that in general, there's this kind of like hacker versus developer distinction, where you know how, how much value is there and keeping good records? versus how much value is there and just like jumping in and keeping a regular cadence, so you don't have to write things down. I guess there's a there's sort of an approach I've seen where you're just basically doing a series of hackathons and your Sprint's are loosely structured, and then there's another approach that would be more like a traditional engineering firm. That's more rigorous and it was it's rigorous in a different way, but it places more emphasis on records and you know, writing things down and communication in that sense.

Livia 21:07
Thank you, and what tools do you use in your daily work?

Participant 17 21:14
I use $Python$ I use $LaTex$ I use $Jupyter notebooks$ I started using things for myself like $habit trackers$ and $time trackers$ and to do list I use $discord$ whatever, you know, whatever the client wants to communicate in like $Slack$ or $telegram$. I use $Twitter$ to just be exposed to things that are happening and I think that's pretty comprehensive list.

Nathalia Scherer 21:57
That's great. challenges and needs. What challenges have you faced personally in your work as a practicing TE?

Participant 17 22:09
It's my main challenges have been about requirements gathering, miscommunication about the expectations and speed. It's common to feel that you have a clearer picture of what the client wants and then you think you have delivered exactly that. And then either they say that wasn't what they wanted, or they acknowledged that was what they wanted, but it turns out the or they acknowledged that that was what was written down but now they want to try something different. And there's not like a lot of value placed on what was delivered. So I think having clear requirements or structure has been one of the biggest challenges and then the other is having what I would consider realistic expectations about what can be achieved quickly.

Livia 23:11
That's great. Yeah, that it's great to have that perspective. What what do you think are the common pitfalls when practicing token engineering?

Participant 17 23:22
I think impatience. Impatience, Not being able to translate ambitious ideas into specific steps to take trying to do too much at once. Lack of focus on one particular area lack of namehnical knowledge is something that pops up Excessive emphasis on things valued in US dollars. Trying to get rich quickly or trying to be sure that the price of a token doesn't drop which is not something anyone can control. Those are the biggest things.

Livia 24:31
To clarify when you say excessively mentioning things in US dollars. Would you like to see other measures being used?

Participant 17 24:47
Yes, I think that do you mean other economic measures

Livia 24:53

or other units of measure? Well, we'd replace the USD when communicating

Participant 17 25:05

well the first thing would be did the system survive? There are systems that have survived enormous swings in their USD price. And the Bitcoin network is a really good example. You know, the Bitcoin network has experienced massive rises and falls in price and yet people still engage with it. So I think USD is a way of capturing the value of the network in a certain context that at a particular moment, but I think the issue is not measuring in USD, it's optimizing for USD. That's what I think the issue is.

Livia 26:00

Thank you, and what do you see are the most pressing needs for the token engineering field to address?

Participant 17 26:07

Think accessibility. Yeah, so despite all of the great educational work that's being done in $name$ and $name$ and other places I feel that there's still a lot of gatekeeping in terms of it's not possible to come in with zero background knowledge and then really be a strong there's not a path to coming in with zero background knowledge and then really developing both the knowledge and experience to be good at this. Most of the people I see who are really good at it already had advanced degrees from somewhere. And so they were just kind of translating. So I think accessibility. I think mentoring, like having one of the big things that a traditional institution would offer is the fact that at some point you get to apprentice directly with someone who has achieved in what you want to do. So opportunities for apprenticeship and shadowing would be really good and also making sure that the focus whatever the objectives are, is clearly focused and communicated. Interesting, you're bringing this from the teacher perspective now because we just had an earlier interview bringing the same point for from a student perspective.

Nathalia Scherer 28:05

Do you have thoughts on how to increase diversity? And inclusivity?

Participant 17 28:10

Yes, one thing is to make clear what what the rules are and practices for a given space are things like people, people's pronouns being respected people's you know, whoever they present themselves as and wish to engage as that that's, that's okay. So I really wish that TE space had a wider array of how people represent themselves and it feels like there is a lot of emphasis still on meatspace identity as a as a signifier. That one is serious or trustworthy. So I think like being open to the diversity and people's identities, as whatever they wish to be, is something that I think would be cool for increasing diversity and inclusivity in TE and the second thing that I don't know how to I think also that stronger community of mentoring and connection would be helpful for that. Because one thing that tends to be exclusive is when there's a culture of you need to just go research this on your own, and there isn't any type of parallel engagement or structured engagement on that. So making sure that it's okay to ask for more explanations that people are discouraged from over namehnocalyzing things so that conversations are not limited just to people who already have strong expertise. In the field. In academia, we call this vertical integration. You want people who are like all different skill levels and you want them to all feel comfortable in the space so there's something for all of them. I think those are the two things I would suggest or point out.

Livia 30:35

Thank you. Yeah, those are great. And in your perspective, what are the incentives to be a practicing token engineer, in terms of value and form? So intrinsic and extrinsic?

Participant 17 30:49

I think intrinsically the challenge I mean, you're it's a fast moving field that is definitely on the frontier of human knowledge. So the challenge is inspiring. And intrinsically, also the fact that this has the ability to be very long ranging work like it's likely that what you do will matter in 100 years. Of course, there's the extrinsic motivation of reputation and money, which is always nice. I'm trying to think of anything else. Yeah. So the novelty of it, the challenge of it, and then the like material compensation possibility.

Nathalia Scherer 31:47

So we're trying to understand what is the range of what people have been compensated? What do you think is the average salary of a TE?

Participant 17 32:03

I have no idea. I make $100 an hour. And my, my agent bills at $200 An hour and then we split it 5050. So they basically handle all of the business and recruiting clients. And so just tell me where to show up and what to think about. I think I've heard as high as $600 An hour and as low as $30 an hour if that's helpful.

Nathalia Scherer 32:40

Yeah, that's super helpful. So you have what would you say you have a firm or, or is independent work with an agent.

Participant 17 32:56

Yeah, I work with $block science Labs$, which is a spin off of $block science$. And I think I'm an independent contractor namehnically. But I have I won't do any work that doesn't go through them that isn't approved, like I don't like to don't like to

have multiple different allegiances and have potential for conflicts of interest and it just gets cognitively draining really quickly. So I'm a contractor for $block science labs$ is the best succinct description.

Livia 33:39

Thanks for sharing that. And now, perspectives for the future. What do you wish for the future of the field? And how do you see it in the next three years?

Participant 17 33:51

My hope would be that there's a native token engineering, you start to see token engineering natives who have success in the field where they started in the TE ecosystem or they started you know, somewhere online, and they went from zero to legend solely through that infrastructure. I guess that there would be alternative pathways outside of traditional academia and industry, where people could learn everything they needed and get everything they needed. In the next three years, I think the competition is really going to ramp up. Because the money will probably be become worth adventuring into or the stability will be there. Like if you're if you are currently a top flight $Kubernetes$ engineer. There's no incentive to come in the token engineer because you're making a lot of money. And you're in you're in high demand, and the money is consistent. And I think one thing about the token engineering field that I've seen is the money is very much tied to what the market is doing. And so the money is not really consistent in the terms of like how much you can make in a week. It has. Yeah, I've seen the demand and what people are willing to pay drastically oscillate over the last two years. So I think, you know, to the extent that this becomes independent of the market, it's likely to create more competition and things will become kind of more stable

Livia 35:53

and I'm curious and your perspective, you emphasized that you wish to see token engineering natives from learning from the field itself. And we've been getting some perspectives on the engineering term of token engineering as something that might be required for the practice. What are your thoughts? On the engineering of token engineering?

Participant 17 36:46

Engineers are extremely good at message discipline and engineering as a field is really good at dominating conversations. As a math person, I experienced this. The university, several universities that I was at both as a graduate student and a faculty member you had the tail of engineering wagging the dog of low level math courses. And even if you look at $Trent Mchounagy$'s essay towards the practice of token Engineering. He really does this like magic trick where he takes a problem that engineering created of this $Tacoma narrows bridge$, and then is able to cast engineering is the hero in that scenario. And there's he actually embeds the reader in, like the lights you are seeing now are a result of engineering. It's an incredible piece of writing and its impact. Engineering is also like people adapt engineering to be whatever it is in that context. So it almost is a meaningless term. You know, the different types of engineering. I'm not sure that there actually is anything in common if you look at all the different things that get called engineering is so it's a really a amorphous term. So I understand why people like $name$ and $name$ are going to point to the intellectual practices of engineering as being helpful to cryptocurrency research, but I'm not completely sold, that that's the right overarching framework to do this work. And I think, I think for me, to the extent that it is an engineering discipline, it's best understood as an offshoot of software engineering because at the end of the day, you're building software, and things like unit testing, for instance, I'm gung ho about unit testing. And I want to convince the token engineering community of the value of unit testing as a practice, but some of some of the things that pop up it's like, engineering as a toolkit is good. It may not be the case that engineering as a set of practices is always the right framework. So I guess I would say I think it remains to be seen. And I'm a bit more skeptical than probably some other people who come from engineering backgrounds.

Livia 39:49

That's a very valuable perspective. Would you call it something else?

Participant 17 39:53

At this point, I don't think the cognitive load of switching the terminology is worth it. But I don't know that let me use this analogy. Initially, automobiles were called horseless carriages. Right. And that's, that's a valid description, but it obscures the way in which an automobile is different than a carriage. It's not just the carriage without a horse. Token engineering if it means we will figure out how to work with token systems in reliable ways that mirror the reliability of other engineering practices that works for me, token engineering as we're going to take a set of engineering practices and just map them over to the study of tokens. I don't think there's as strong a case for that maybe as an initial starting point. But my hope would be that the discipline builds its own. Its own engineering structures.

Livia 41:12

Thank you.

Nathalia Scherer 41:14

Yeah. That's very, very interesting perspective. And are there any specific developments or innovations that you would like to see and his wish for the future?

Participant 17 41:26

Yes. I would like for the space to be permissionless very permissionless in terms of like social infrastructure. So I haven't really engaged with the $name$ in like six months or so it may be that all these things are being addressed, but there's a tendency to not have a default, a way for extroverts. Like you posted something about tracking how much each person was talking and that being a really good measurement. So to the extent that we can look at things like meeting dynamics and you know, it's easy to generate data about how much each person talks I guess the socio social aspects of these systems, seeing greater scrutiny. And greater transparency is something I'd really like to see. I'd like to see deeper conversations that start with fewer assumptions and build from from like, first principles. In terms of namehnology, I think that I think the challenge is to is twofold. One is to make once we understand what we're simulating to make the simulation yield insight faster. But there's also the the step of making sure that we're seeing what we're simulating. And there's, I mean, there's good stuff out there like the $CADCAD$ bootcamp course does a good job of walking through this process, but I think what's missing are these intermediate projects that people would typically do. So I think having more projects that people can build as a bridge between just the theoretical knowledge and actually having it in their hands. I know people are really bullish on AI and I am too but I think that the most value will come from really tuning AI systems from the ground up to work with you, rather than just taking something off the shelf and taking a general purpose model. So my fantasy is to have an AI graduate student where I spend the same amount of time working with him than I would with a real graduate student. And then in two years, they have developed a highly specialized knowledge base. But that's not something I could do with like $Chat GPT$ because it doesn't remember I would be better off starting from my own, you know, initialized model and feeding it exactly what I wanted to to learn or starting with $Chat GPT$ and forking it or something. I'm not I don't think people will be able to take just the general purpose models as they're built, and run them without some customization or some more tinkering.

Livia 45:04
Have you been in touch with $name$ and $name$ recently?

Participant 17 45:09
I haven't talked to him recently. And I know he's been working on this stuff with $name$. I'm excited to see what he does.

Livia 45:16
Yeah, they have been making very great progress and it's something on the direction of what you're sharing.

Participant 17 45:24
Yeah, I'm hoping he'll present on it soon.

Nathalia Scherer 45:30
Yeah, awesome. I hope there are synergies there. It would be great to have an AI students from so we are approaching our last question. That is whose work do you admire in the field and who do you recommend we talk to next? Keeping in mind that we are closing the interviews this week. But if there is someone that's very important, we would love to chat with.

Participant 17 46:02
So you probably talked to most of the people that popped in my mind. I have a really high opinion of $Zhiwei$.

Livia 46:17
good good call. I didn't include her.

Participant 17 46:22
Yeah, I have a really high opinion of you. A $name$ is great. I'm trying to think who else, $name$ Do you know $name$?
47:00
Yeah, we talked to him.

Participant 17 47:02
Okay. I like $name$ quite a bit. $name$. I mean, obviously, $name$ $name$, $name$. $name$ $name$. I think $name$ is really good at system design. He doesn't have the formal math background to always communicate what he's saying. But when I talked I worked with him at $name$. And when I talked to him, it was clear that he had a really strong intuitive understanding of how to how to do these things. It's interesting because he was a oil pipeline engineer. So he kind of sees like, how to flow things together. But he's not a traditional like academically trained engineer. Trying to think if there's anyone else. That's a good list. I mean, those are the probably the top people that pop into my mind offhand.

Nathalia Scherer 48:26
Yeah, that's great. There was a few here that we didn't chat with.

Participant 17 48:31
I think also $name$.

Nathalia Scherer 48:38
Is him a different $name$ than $name$?
48:46
Yeah, I think the $name$ you've talked to as $name$ the row row your boat. Yeah. So $name$ is on Discord as $name$ and he has a really strong he leveled me up on the level of on the levels of testing that are necessary in traditional software engineering and like what you how much testing you need to do to really feel like your system is working as intended. So

Livia 49:22

you mind sharing his discord with me?
Participant 17 49:26
Yes, I can do that. Thank you How do I get that?
Nathalia Scherer 49:39
I think you have to go like if you type name and
Participant 17 49:45
Copy username there we go. Here you are.
Livia 49:56
Thank you thanks so much.
Participant 17 50:05
Of course.
Livia 50:06
Do we have any final final questions?
Participant 17 50:14
No, No, I think do you? Are you asking me if I had final questions? Are you asking?
Nathalia Scherer 50:28
I was asking. If she had any final questions,
Participant 17 50:31
then I will be quiet and listen for the final question.
Nathalia Scherer 50:35
No, no, actually, I don't have any final questions. It's been really, really great to hear you, name. Thank you. And if you have any, any final comments or considerations, anything you'd like to share?
Participant 17 51:02
I think the main challenge is that people don't have a clear distinguish between token engineering and tokenomics. And on the one hand, that's kind of silly because if people think about engineering and economics, they're not likely to get them mixed up. But because of the fact that cryptocurrency became so financialized for several years, I think that the financial aspects of things became a primary focus. But that's not really what engineering is about engineering is about designing systems that achieve intended purposes. And it's like two separate questions of can we get the human being to the moon is an engineering question. How can we pay for it? How much could we make on it is an economics question. And the economics are really important. Nobody's likely to do these things if they're not, you know, getting some incentives, but they're separate questions. So I think people come in to token engineering, thinking that it's about making money and that's a separate thing. Engineering is about building systems. And then someone needs to figure out how to pay for it. That's my opinion.
Livia 52:31
That's a great last quote. Thank you so much, name, it was a pleasure to chat with you.
Participant 17 52:38
You as well, and I hope to see you around more often in the upcoming years.
Livia 52:43
Yeah, me too. And I hope you you have a good recovery, slowing down a little bit as much as you need and that you're enjoying the time you're spending and the work you're doing.
Participant 17 52:57
Thank you so much. I'll see you soon. Nice to meet you again. And y'all take care
Nathalia Scherer 53:03
Thank you. recording stopped