EPISODE 574

[INTRODUCTION]

[0:00:00.3] JM: Technology is pushing us rapidly towards a future that is impossible to forecast. We try to imagine the future as it might look like and we can't help having our predictions shaped by the media that we have consumed. 1984 Terminator, Gattaca, Ex Machina, Black Mirror, all of these stories present a dystopian future. If you look around the world, the most successful technologists are usually guided by a sense of optimism.

Technologists themselves are idealistic. They see the future through a utopian lens, more often than a dystopian lens. Popular media largely tells a different story, that we are headed inexorable for a dystopian world. Why is there such a gulf in the level of idealism between technologists and the media?

Mike Solana found himself asking that question on a regular basis during his work at Founders Fund, where he's a vice president. Founders Fund has a bias towards Funding difficult cutting-edge technology like gene editing, robotics and nuclear energy. This technology that Mike was seeing made him excited about the future, which led to his creation of the podcast Anatomy of Next.

Anatomy of Next has explored biology, robotics, nuclear energy, super intelligence and the nature of reality. Soon the podcast will explore how our civilization will be settling the solar system. specifically Mars. I've listened through the entire first season of Anatomy of Next twice, and I enjoyed it so much because Mike explores questions that are on the border of philosophy and technology; questions about the nature of reality and what makes us human.

There's nobody that can give perfect answers to these questions, but Mike does interview top experts on the show, which provides me as the listener with a framework for thinking through these impossible questions. The guests include Nick Bostrom who's the author of *Superintelligence*, George Church who's a pioneer in gene editing and Palmer Luckey who is the Founder of the VR company Oculus.

Mike joins the show to talk about why he started Anatomy of Next and his own perspective on the future. If you want to discuss this episode with other members of our community, you can come to softwaredaily.com. You can also find 700 episodes of Software Engineering Daily there. We've got tons of episodes on blockchains, artificial intelligence, business, distributed systems, tons of other topics.

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Thanks for listening and let's get on with this episode.

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[INTERVIEW]

[0:04:37.5] JM: Mike Solana is the host of Anatomy of Next and a VP at Founders Fund. Mike welcome to Software Engineering Daily.

[0:04:43.4] MS: Yeah, thanks for having me.

[0:04:45.2] JM: Your podcast Anatomy of Next is about exploring the future, and the first season explored the idea of whether the future will be utopian or dystopian. Why does the question of utopia versus dystopia interest you?

[0:05:00.0] MS: I think that it's less about the tension between dystopia and utopia, because there is none. I think, culturally were obsessed with dystopia, and that was the genesis of the entire project. It was looking around being really excited personally about the things that I was seeing, especially at Founders Fund. I mean, we were looking at companies working on synthetic biology and nuclear power, artificial intelligence, and this was before AI was really what it is today. Today it's this, I mean, almost a meaningless buzzword, because everybody says they're an AI company.

I mean, seven years ago when I started working with Founders Fund, it was still a radical idea. All of these things are fairly radical and they can be scary. Certainly when you look at Hollywood's representation or portrayal rather of these technologies, it's always in a really terrifying way; with biotechnology in particular I mean, that's a really easy one. Try and think of a movie that centers around some form of genetic engineering that isn't a horror film? I mean, is there any positive representation, or is there any positive portrayal of synthetic biology in film history? I literally can't even think of one example.

[0:06:05.4] JM: Maybe Contagion.

[0:06:06.4] MS: Yeah, I've actually not seen Contagion. Tell me about Contagion.

[0:06:09.1] JM: Well in Contagion they manufacture the cure for the Mother Nature created global disaster, that is a virus that's killing everybody. They make it in a lab and that one works.

[0:06:24.8] MS: Okay, so I love that, and these are the exceptions that make the rule. That's great and that's what I want. I want to see that. I mean, that's the truth. That's reality. We've had all these people working on these cool things and I felt their stories weren't being told, and there are reasons that synthetic biologists are excited about synthetic biology, so I thought, "Okay, we'll bring in the people to tell the horror story of each of these five really scary technologies, and then we'll bring in folks from our community who are actually working on it," so it's myth bust the dystopia and outline a different possibility. What if all of this stuff just worked? That was last season, yeah.

[0:07:00.1] JM: Generally, I completely agree with you. This is one of the recurrent themes of your series. You have these segments from Jurassic Park and you contrast that with real-world geneticists. You have Dr. Strangelove, contrasted with real-world discussions of nuclear energy, you have Terminator contrasted with real-world discussions of super intelligence and obviously, there are concerns with all of these, but the movie concerns are oftentimes very disjoint from the actual concerns that we should be biding our time with.

[0:07:31.8] MS: There's always this question of the motivation. I mean, why are folks in Hollywood telling stories like this? I'm a fiction writer myself. I think that dystopian fiction is just so much easier to write than any fiction grounded in reality, or certainly in constructing some world we want to live in. I mean, dystopia is easy. It's usually just one premise, one thing goes wrong, one technology comes up, it destroys everything and now we're living in this post-apocalyptic world. They're easy to write about.

First of all, they're easier to write about. These post-apocalyptic worlds are easier to write about. Then on top of that, there's just so much more drama in a post-apocalyptic world, and drama drives a plot forward. I think that storytellers have a natural impulse to tell really scary stories. It's just much more difficult to get people inspired about something. That's what I wanted to do. I would say that I don't think necessarily that people should stop telling dystopian science fiction stories. I mean, they're fun. I love horror movies. I love dystopian science fiction movies myself. I mean, I get a kick out of them. I just want to see more of the other stuff. I want to see people really trying to think about the world that they want to exist.

[0:08:40.0] JM: The other thing that you explore is that these dystopian ideas can be a self-fulfilling prophecy, because if all you're fed is dystopia, even when you turn on a Pixar movie and you're watching Wall-e, even Wall-e is it dystopian movie. If you're fed this stuff constantly, then you start to believe that this is the only future that the world can manifest as, which of course is a self-fulfilling prophecy, because you'll just career towards that future and feel there's nothing you can really do to stop it.

[0:09:16.7] MS: Yes. I think that's certainly possible. I'm less concerned about people manifesting the dystopia into their life. than I am about the lack of manifestation of the Utopia into their life. I think that all these things require action, so I think it's – you watch a dystopian science fiction film about AI and you watch some utopian version of it. Let's say Her, I think was a really good example of a movie that had a positive, exciting, realistic, I think, ultimately realistic portrayal of AI.

I think Her is much more likely to motivate someone to build something beautiful that can help people. Then a movie like Ex Machina is to motivate someone to build a killer robot. I don't think the dystopian films are going to motivate people to do terrible things. I think it's that no one is creating the kinds of movies that are going to encourage people to build the thing that we want, the world that we want to live in. That's what I'm trying to do with this whole series is be like, "Hey, the Utopia stuff is actually exciting. It's not silly, it's not this Pollyanna-ish,stupid approach to reality. I'm not silly for thinking that the world can be better. It actually can be if we work towards it, but we need to think realistically and we need to think realistically about our potential and then pursue that potential."

[0:10:36.4] JM: The categories that you cover in the podcast are nuclear energy, biology, robotics, super intelligence and reality. The season starts with this nuclear energy discussion and nuclear energy holds significant potential, but it's perfect example of one of these topics that often gets associated with dystopia, it's somewhat taboo, because people associate nuclear with horrific events. What is the reality of this matter? What's state of development in nuclear energy?

[0:11:10.8] MS: Well, the reality of nuclear. I mean, I wish that we could have some folks that I interviewed on this podcast, people like Leslie Dewan are great, Taylor Wilson fantastic. These

are people who are working on the nuclear frontier and trying to bring about a more nuclear-powered world.

The reality is nuclear is one of the most important tools we have at our disposal. It produces vast amounts of clean energy. The danger of nuclear energy is grossly overstated. The danger of nuclear waste is grossly overstated. Then on top of that, I mean, these are with pre-existing models of nuclear reactors. We have this whole entire fleet of alternative nuclear reactor designs that we're not even using in America in particular, in the United States in particular. For years, the government has only allowed one reactor and it's –

There are all these different types of nuclear reactor designs that were not only created recently. Some of them were created decades and decades ago. We just we just haven't built them, because the government has standardized the entire development process. We're using this one type of reactor that produces lots of nuclear waste and that is much more dangerous.

[0:12:20.7] JM: Wow. This is not even a question of taboo. This is a question of standardization and some –

[0:12:27.4] MS: Well, it's both. The reason that it's so difficult to get anything, to move anything forward in the nuclear space is because people are terrified of it. You also have a lot of people specifically, I would say on the left who paradoxically care a lot about the environment and things like global warming, but hate nuclear because they think it's bad for the environment. It's unfortunate, because this is the thing that gets us to a carbon-free power source that actually moves the dial, things like solar and wind and hydro are not nearly enough. We don't have nearly enough energy coming out of those things, and we're not going to for a very long time. This is the only thing that I can think of that could really have an impact right now. Then yeah, there's just a lot of mass panic. We have so many portrayals of just nuclear Cataclysm in our media that really just changed the way people think about this stuff.

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That e-book is available at aka.ms/sedaily.

[INTERVIEW CONTINUED]

[0:15:02.0] JM: In your episode about biology, you spoke about the risks and the opportunities of biology and genetic manipulation. This is an area where there are also taboos. There are also things that you can't really talk about, but biology it seems these things are being explored a little more aggressively. What are the risks and the opportunities of genetic manipulation and how far along are we?

[0:15:30.3] MS: Wow. I mean, that's the 10 million-dollar question and how far along are we, or maybe, I guess 10 trillion dollar question. If you get biology working, it was George Church in an interview with me once said this is the kind of nanoscopic engineering that actually works. You

can program an organism to build something at the nanoscopic level. I mean, that's really what nanotechnology is going to look like.

It's not going to be robots. It's going to be biological machines. I think that the potential is boundless. I think that realistically, the big hurdle right now in actually getting a lot of these CRISPR-inspired technologies to work, these-CRISPR ins inspired gene therapies to work is understanding what the different genes do.

We have all this information on what genes we have and how to cut genes, but we don't know what the specific genes, a lot of the specific genes do, or what the genes do in relation to each other. I think we have a search problem and it's really hard to get your hands on huge amounts of genetic data in the US because of privacy laws. so you may actually see advances. A lot of biologists I speak to think that we're going to see the most significant early advances in China first, because everything is so centralized over there. It's just much easier to get your hands on enormous data sets.

In terms of risks and reward, I mean, the reward is biological self-determination. You get to decide exactly what you are, you get to decide what you look like and what you feel like and how long you live. You could just decide everything about your life. The risk, I mean, there are dystopian risks overstated nightmarish versions of reality, which are we're going to create some weird organism as you see in Jurassic Park that just takes over the planet.

[0:17:08.8] JM: Resident Evil. I remember you talking about Resident Evil. I was like, "Yeah." Throwback to Resident Evil.

[0:17:13.1] MS: Yeah, there are so many good examples of this, because it's just – I mean, the imagination goes right there. I was reading the new Steven Pinker book and I have a lot of issues with it, but one thing that I really liked was how it kept going back to this innate state that humans – to this innate sensibility of the human being, which is to fear things. This is how we stayed alive for so long. This is how we passed our genes on was just to be terrified of everything.

Yeah, it's our impulse to be like, wait a minute you can create new organisms, well, we're definitely going to create something that can kill us and will kill us. I mean, I guess there's some risk of that. It seems really hard to do that. I don't know who wants to do that. I think that what's much more likely is we just cure cancer.

[0:17:54.6] JM: Okay, by the way, I want to jump through these topics and people who want a deeper dive into any of them can look at your podcast and listen to the episodes. I just wanted to say –

[0:18:06.1] MS: What I love about that also is there will be actual experts in each of these technologies speaking to them and not me.

[0:18:12.2] JM: Right, but I loved your narrative. Again, I've listened to the series twice at this point and you have a really good narrative that goes along with – interspersed with each of these interviews and it tells a story in each individual podcast episode, as well as this overarching story across the entire season. It's one of the things I love about podcasting is it's a pretty unexplored media space, and I felt like you – you did explore the medium in a novel way.

[0:18:39.6] MS: Thanks. Yeah, I loved it. I mean, I was reluctant to start a podcast for Founders Fund, because I mean, they're just – everyone's got a podcast now. We really try not to participate in super crowded spaces. We try and do our own thing typically. The medium itself was attractive to me and I thought, "Well, if we do a podcast, I could just do something different. I don't want to sit down and be like, starting companies is hard and here's what a cap table looks like."

I want it to be like, "All right, well, I mean, I have the blank check at Founders Fund. They let me do whatever I want really. Why don't I just tell a story and get people excited about the stuff that we're excited about?" I want it to feel like sitting down with people at Founders Fund and talking about the stuff that we talked about over lunch. We have a bunch of weird people here who have a bunch of weird ideas and I wanted to put a spotlight on that.

[0:19:26.4] JM: Well, you had on some people who I have my constantly scanning for interviews with some of these kinds of people, like Cyan Banister. I've heard her on Jason

Calacanis's podcast a couple times and she's just always entertaining. Nick Bostrom is really eloquent and calm, but also the ideas that he's exclaiming are alarming and interesting and very well thought out. You have somebody like George Hotz, the comma.ai guy and he's basically has fashioned a personality for himself that is endlessly entertaining. Great. Great cast of characters.

[0:20:06.3] MS: When I started working here, I was just so happy to be surrounded by all of these interesting people. I thought this – yeah, this was a way that I could share that. These are these are the people that I get to talk to, these are the people that we all get to hang out with and they're cool, and they have really interesting perspectives on the world, and they're really odd, they're different.

These are not the typical Silicon Valley perspectives, which I which tend to be very dry and, I don't know, there's this just basic Silicon Valley narrative and that doesn't really account for I think most of the people who actually live and work here, and certainly not the people that we work with.

[0:20:42.6] JM: I share that experience. Robotics, so you did an episode on robotics. What did your study of robotics make you more pessimistic about? What did it make you more optimistic about? Tell me about your personal take on robotics.

[0:20:57.4] MS: Gosh. I mean, there's a lot here. I think the thing, the one thing about – let's talk about robotic automation. I think that what was most surprising to me was the way my opinion changed on the universal basic income. I went into it thinking casually that, "Oh, yes. This is going to work and this is definitely what we need and that's going to be the solved to everything."

The more I explored automation and the more I explored VBI, the more I started to think that this was just really alive, that we're all telling ourselves, I think that VBI is not going to fix anything. I think that the real problem is that we're stripping people of their purpose, or potentially, right? This is the other thing; we're assuming right now that we're going to have some mass automation movement, where 80% of all of the labor in the world is replaced with robots.

I mean, this is what people – when I certainly was producing the podcast a couple years ago, I mean, that's what people were talking about. Today people aren't really talking about technology at all in Silicon Valley, but that's a topic for another day. I think that if you can imagine a world where – or if you want to imagine a world where robots just take away 80% of the jobs in the planet, and then you want to say, "Okay, well we're going to give that 80%. We're going to give them a minimum basic income." How much money is it?

I went through some back of the envelope math in the episode. Even if you were to just give someone $30,000 a year, I mean, that would 5x the national budget. There's a question of whether or not we can even afford to do that. Then if we can, if we go to this enormous length to give everybody in America just the bare essentials, just the most – the smallest amount of money you can give someone to make it go of it and feed themselves and maybe afford some housing and clothing, is that really a utopian idea? Is that the world we want to live in where 80% of the people make $30,000 a year and then 20% of the people who control everything are the richest people in the history of the world?

No, it's a horrible idea. Worse than the money, the disparity, far worse than the money disparity is the concept, the notion that 80% of the people in the world are useless, don't have a function, the new world will not have a role for them, a place for them. I think it's lazy thinking. I think it's classist thinking. I think it's the thing that very rich people in Silicon Valley say to make themselves feel better, but in fact is revelatory of who they are and what they're working on.

I think the harder job is to find ways to rescale people, to build tools that are easier to use and to get everybody participating in some way. That's a very, very difficult problem. No one is trying to solve it, because no one is even addressing it.

[0:23:36.7] JM: Right, so this is something you explored in your conversation with Martin Ford, who is well known. He's written The Rise of the Robots, The Lights in the Tunnel, some other books around what happens when automation rules out highly repetitive work that constitutes much of what the labor force is deriving their income from.

This argument against basic income, because it suggests that basic income is not going to work because it would lead to a bunch of people who are bored and restless, and they're out of a job, they're getting this paycheck, but they're not deriving the personal satisfaction that work would otherwise give them.

What I'm skeptical of about that argument is I feel the internet has done a pretty good job of solving boredom and restlessness. If you end up with this population of bored and restless people, don't they just self-select into – some of them retrain themselves, some of them sit on the couch all day and watch Netflix and are just happy with that. You'll have a restratification among the people who are receiving basic income?

[0:24:48.4] MS: I mean, this is certainly the hope of UBI. This is the argument that UBI proponents make. I think it is wishful thinking. I think I think that it seeds the responsibility of designing a system that works for people to chance; it saying, "Listen, this stuff just works it out." This this stuff just works itself out. If we just do this thing, we just give everybody money, they're going to figure it out society will work and function and everybody will find purpose and a few people won't, but who cares? There's no evidence to suggest that.

The UBI was conceived of originally by a bunch of libertarians, which is how I knew about it before it became popularized. I have been libertarian leading for quite a while. I'm not sure what I am these days, but I certainly still have positive feelings associated with, I guess at least the basic impulse of libertarianism. Libertarians created this idea to account for maybe a 10% unemployment. This was really just a way to get rid of the government interference in personal lives.

Instead of telling the poor, "Hey, you have to eat government cheese and this one meat." It's like, no, let them have the money and make the decisions on their own. Why are we trying to be paternalistic about this and telling already impoverished people, already beaten down people how to now live their lives and trying to control them further?

It was an interesting idea. It's being applied now in a very different context. I don't think the same arguments can be made. I think that we need to think of something else. Universal basic

income was not conceived up for 80%, 90% unemployment, and the truth is we just have no – there's no data to suggest that this is going to fix anything.

There's also nothing to suggest that there's even a problem yet. I mean, that's the other thing, it's like we're talking about a problem that does not yet exist. I think it's certainly, I think automation, automated labor is certainly the future. There's a question of how long it will take to get to that future and if it happens all at once or in parts. If it happens all at once, that could be very destabilizing and scary. If it happens in pieces, industry by industry, a piece of industry by piece of industry will have a lot of time to figure things out and recalibrate. I don't know. I don't think there are enough people really exploring these concepts seriously. Most people are just making very excitable arguments in one direction or the other.

[0:27:02.0] JM: This is, by the way one of the things that makes these different spaces hard to explore, because it's unclear what is even the time horizon that you're supposed to be exploring them on, because if you explore them on too long of a time horizon, then you end up with if something new gets invented like the internet, or social even social media, or the sharing economy to use that overused term, all of these things will often turn something on its head an idea like basic income on its head.

If you've put a ton of premature work into studying a topic and then something new comes along and disrupts a lot of the foundation that you've built around, you have to rethink your ideas. At the same time, you do want to think on a long time horizon, because you want to develop theses around these ideas and you want to develop the arguments and the counter arguments and get the whole framework in your head, so that when something new and disruptive comes along you can already have the framework around which you can do new forms of calculus to some new technology that comes along. It's something that makes these spaces fun to explore but also difficult to explore, because it's unclear when you're prematurely optimizing.

[0:28:15.1] MS: Yeah, I think you're right. It's absolutely essential to be thinking on longer time horizons or to be thinking about longer – to be thinking in terms of longer time horizons. You also have to be flexible. This is something that dogmatic people never are. A lot of the UBI proponents are dogmatic. It's a political idea and political ideas tend to be very tribalistic and

team-oriented and you don't want to let them go, They tend to not mean the thing that they ostensibly means.

In the case of UBI, I think there are lots of people who are obsessed with UBI, because either one, they're actually socialists, or two, they are actually – these tech elite type people who are total classists. I think that that you have to be very careful with ideas that have tremendous collective blind support in general. It's hard to stay flexible. I have a hard time doing it myself. I'm always getting excited about things and not wanting to let go of them. I wish there was just a stronger culture of reminding people like, "Hey, you're obsessed with this idea right now. You can't see clearly. We need to adapt."

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[0:29:29.4] JM: Users have come to expect real-time. They crave alerts that their payment is received. They crave little cars zooming around on the map. They crave locking their doors at home when they're not at home. There is no need to reinvent the wheel when it comes to making your app real-time.

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[INTERVIEW CONTINUED]

[0:31:12.9] JM: Super intelligence is the next existential coin flip that you explored in the podcast. From that episode, it was pretty hard to tell what your personal opinions were if you had any concrete personal opinions. Do you have a set of beliefs around super intelligence that have calcified?

[0:31:35.8] MS: Speaking of religious ideas, I mean, I have – yeah, I have a lot of opinions and thoughts about this. They're probably my weirdest opinions. Some of them are my least grounded in reality.

[0:31:46.3] JM: Take me there. Take me there.

[0:31:48.9] MS: I mean, I think that's –

[0:31:51.1] JM: Which ones can you explore on air?

[0:31:54.0] MS: Right. I think that if it's possible to build a super intelligence, it is inevitable. I believe that is the human condition. I think that we build things and I think that if it's technologically possible, we're going to do it eventually. If we're going to do it eventually, then that means eventually we will create something that can make itself more intelligent. If we can create something that will make itself more intelligent, it will likely do that and it will do that exponentially, because the smarter something gets, the better it will be at making itself smarter.

You could conceivably go from a computer that's just slightly more intelligent than us, or a biological entity that we create maybe a synthetic – a synthetic creature that is slightly more intelligent than us. You could go from that to something that is drastically more intelligent than us.

Especially in the case of a computer, it could happen almost instantaneously. It could happen in the span of hours, or days, or weeks. The question is what is something that look like? How does it think about the world? What can it do? There are all these senses that we're limited by. We have these five senses that we're limited by.

The super intelligent being won't be limited by those senses. There could be whole aspects of our reality that it is capable of seeing that we're just not, and I say seeing because again, we lack the language even to explore the things that we don't know, we don't know. That having been said, I mean, the ultimate potential of something like this could be godlike. It could be biblical, it could be really wild. Because I think it's possible, as I said, I think it's inevitable, and because I think it's inevitable, I think in some sense maybe it already happened.

That's really crazy. That's the craziest thing. I don't believe it a 100%. It's just something I think about. I think we're heading in this direction. I think there's nothing to fear and that's really the question that is probably worth exploring, because it's very, very popular right now to tell the angry God version of this.

[0:33:47.6] JM: Yeah, okay so the angry God version. I think it's worth exploring that one. It's also worth exploring the paperclip maximizer thingy.

[0:33:55.6] MS: Yeah, I think the paperclip maximizer is actually more grounded in reason, I would say. That's a reasonable concern. The angry god one is just – it's wrong for so many reasons. Or not wrong. It's not that it's wrong. It's not right. I mean, we're assuming that it's right, and I think it's certainly not that. I think we've certainly not proven anything even close to that. I was talking to founder of a deep mind a while ago and he gave me the analogy. He was talking about the evolution of humans. He cited the fact that we've become more intelligent over the last, let's say a few hundred years, really since the Enlightenment. Societies have become collectively more and more and more intelligent. As we become more intelligent, we've become more empathetic; violence has decreased, social protection programs have proliferated, people have become more charitable, people have become more caring and nurturing.

The only data points that we have about the correlation of intelligence and goodness seem to indicate that the more intelligent you are, the better you are. One extrapolate from there and assume that something even more intelligent than us will be even more good than we are. We don't know this for sure. I think that there's no way to know for sure what a super intelligent being is going to be, but certainly the only evidence we have indicates the opposite of what we

currently collectively believe, which is that this thing's going to be evil. There's no reason to believe that. Yeah, there's none at all.

[0:35:22.0] JM: Right. To avoid going too far down the superintelligence rabbit hole, are there any other common bad assumptions about super intelligence that bother you?

[0:35:32.9] MS: Yeah, I think that we're really far away from it. I think that for a while in Silicon Valley there was this assumption that it was going to happen any minute now. I think that when the singularity, if the singularity were to happen, it would happen very fast, but our work towards that seem – I mean, we just seem to be so far away from it. Right now, where we're getting better and better at making machines that can do what we tell them to do.

The question of what is will? How do you make something want something? I don't think anyone's even really exploring that, and the reason is because I think many of the people building this stuff don't believe in it, or at least some. Certainly George Hotz in the interview, he dips a bit into the concept of, or the question of what is consciousness and he doesn't believe it exists. He doesn't really believe in things –

[0:36:17.3] JM: Yeah, do you agree with him on that?

[0:36:19.2] MS: I don't. It's a super complicated argument. I'd have to go back and – I think before I comment – we talked about this over a year ago. I'd want to go back and it's deep in it and re-familiarize myself with the argument. But no. I think about Aristotle's law of identity ASA. We have to start somewhere in terms of trying to understand the world around us, we have to start somewhere. The law of identity is this thought that okay, well let's just start with the fact that I exist. There are some philosophers who would sit here and stare you in the face and say prove it. You don't exist. I don't think you exist.

It's like, okay, well maybe in an academic setting, I don't exist but I know that I exist. To even begin to try and understand the world around me, I have to start from somewhere, so I'm starting there. I exist, the physical world around me exists, I know that I am conscious, because I'm conscious and that's where I'm starting. It's a simplistic take maybe, but yeah, that's where I begin, with the fact that I'm conscious, with the fact that a machine doing exactly what I tell it to

do is different than me deciding what I want. Not even what to do, but what I want. It seems there's more happening there.

I don't think we fully understand it, because I don't think that we fully understand how the human mind works. It's somewhat arrogant to think that we're going to build a mind when we don't even know how our own functions.

[0:37:40.8] JM: Nice segway into the last episode of the first season, which is reality. You cover the topic of reality. You have some really good guests on this one, like Nick Bostrom. You also talk to him during the super intelligence discussion of course. To what you just said, you have this axiomatic perspective where you're saying I need to have this identity, because I build everything else around me around this identity axiom, and maybe I'm paraphrasing you incorrectly there, but I think this is – analogy is you spoke to Bostrom and you asked him about the question of assigning probabilities to the question of whether we live in a simulation like you asked him. What's the probability that we live in a simulation? You're this brilliant computer scientist. You just imagine these –

[0:38:28.0] MS: Tell me. I'm dying to know.

[0:38:30.9] JM: No, you literally just imagine this chalkboard that he's been writing, like the grand unifying theory of the simulation on and he has this some variable somewhere that is the probability we live in a simulation. You're just like, "What is the value of that variable?" He balks at the question, because you can't give a precise estimate. There's really nothing to support such an argument. Do we live in a simulation or not? I'm sorry, I cannot tell you. I literally don't know and I'm not going to pretend that I do know. I liked that response, because it showed a lot of humility to his approach around the question of reality. What were the other questions you were trying to address around the subject of reality?

[0:39:12.2] MS: With the simulation argument, I wanted to highlight our potential here. I think that's the most exciting. Again, this is another one where – I mean, this is not to go down this rabbit hole, but I mean, this is another one where if you believe that it's even possible to build a simulation, then it's certainly inevitable. If it's inevitable, then it probably already happened, and this is one where if it already happened then you're actually already living in it.

It's very hard to get out of that mud. It's like, once you're in it, you're like, "Fuck, we're in a simulation. We're definitely in a simulation and you can't get out." Yeah, it's this black hole that you get sucked into. I think I wanted to start there, because I mean, I don't think the simulation stuff is – I think the simulation stuff is pretty utopian. I mean, it's the idea that you can build realities, whole realities. Not even worlds anymore. We're talking about realities.

Then you could build layer on top of layer on top of layer. You could live in as many different ways as you want. You could be immortal. Certainly, you would be if you could live, let's say an entire human life in a few moments over and over and over again, all different kinds of lives. You can get inside of the heads of different people. This is like the matrix, but a good version of it, an exciting positive version of it. That's the potential. It's really cool.

[0:40:22.1] JM: Especially if you agree with the deep mind guy and his extrapolation of this comforting extrapolation that as we go towards super intelligence, we get more and more generous existence.

[0:40:33.9] MS: Yeah, again there's no way to prove that that's true. It's just the little bit of evidence we have suggests that that's the direction we're heading, not the other direction. Yeah, I wanted to start with the potential, the absolute shining exciting potential. Then there are these lower hanging fruits and that would be augmented reality. Not even virtual reality. Virtual reality is cool. You saw Ready Player One, that was exciting. Loved the book. Definitely think it would be cool to create a world like that and have fun in it and live in it.

I think augmented reality is super, super, super exciting and we'll have lots of practical applications that are almost immediate, things like surgical assistants, construction assistants, architectural assistants, lab assistants. This is the machine that could help people, augmented reality systems could actually be one of the tools we were talking about earlier in the context of universal basic income verse rescaling. This is the thing that we could add to our arsenal to help empower the people who maybe don't have a place right now in the new technological economy.

[0:41:38.7] JM: You started the second season of Anatomy of Next with this exploration of Fermi's paradox. This episode had a really good discussion with Cyan around simulation and the nature of existence. Explain what Fermi's paradox is and what are the themes that you were trying to explore in this episode?

[0:42:00.7] MS: Sure. Fermi's paradox, this is the idea that it's grounded in this thing called Drake's equation. Drake speculated that given the number of planets, the number of stars in the galaxy, the number of planets around each star, the number of those planets capable of supporting life, the number of those planets that would actually create life, the number of those planets that would actually create intelligent life, it would be a small amount, it would be a small number of planets that would create intelligent life.

Certainly, if life is a natural phenomenon, a naturally occurring phenomena, then on a scale of trillions of stars or whatever, there should be life all over the place. The galaxy should be teeming with life. Many of those life-bearing star systems are much older than earth. Now we've seen the way technology progresses on our own planet. Imagine a civilization more technologically advanced than us, by let's say a 100 years, 500 years. It would be extraordinary.

What about 10,000 years? At that point, you'd be building things in the galaxy that we could definitely see here from earth. You'd be building new stars. There'd be pulsing objects, maybe from Dyson structures taking, or capturing large amounts of the solar energy. Realistically, those life forms would be here. I mean, they'd be checking us out. They'd be saying hi. We'd at least hear signals from them, radio signals.

The Fermi's paradox is if life statistically should be everywhere, if we should see it everywhere, then why don't we see it at all? Why is there not even the tiniest shred of evidence that life exists, that's the paradox? It should be everywhere, but it's nowhere. You have to answer it. What is the reason that we don't see it? The answers typically fall into a few different buckets. It's like some people believe that life destroys itself, some people believe that life necessarily destroys itself, it's baked into the way that life functions, some people believe that life is already here, some people believe that it doesn't exist, that there cannot be any alien life anywhere else, that we're rarer than we think.

Yeah, so that's Fermi's paradox in a nutshell. The reason I explored it was because, I think that it's it ends up just being a Rorschach test for the way that you think about life and the world. It's a really great question to ask people to learn about them, more so than even the universe. They're fun things to talk about, but really what you get to do is you see that the way that people think when they ask themselves questions like this.

[0:44:20.1] JM: Now you've started off this series exploring so many of these giant questions, and it makes me wonder where you're going next. Because if you've explored so many of the giant questions, you either have to go lower level, you have to go deeper into specific topics. Tell me what's going to unfold? What are the next themes that you're going to explore and what are the narratives you're going to try to formulate?

[0:44:45.9] MS: Yeah, so what I've decided for this season and we're about to launch actually, the first half of the second season is good to go. It's going to be a much longer season, at least 13 episodes of produced content and then tons of supplementing content, or supplementary content. It's going to be one story. The story is Mars, not just how to get there. I don't think that's really that interesting of a question. I think the really exciting question is what we do once we arrive on the red planet. How do you turn a dead world into a new earth?

That is the goal. I mean, we're talking about going to Mars, building an atmosphere, bringing back oceans, eventually creating plant life that can live in an alien environment and going from a red planet to a new blue and green marble in our solar system, then building a civilization on top of that. What is perfect city on Mars look like? What is education on Mars? What is money on Mars? What is music on Mars? These are the things that I want to explore.

I want to touch upon the themes that I began to explore in the first season, but in a way that's grounded in a metaphor. I want to build I want to build very unambitious of me, I want to build a new city on a hill, but the hills on Mars.

[0:45:55.0] JM: Well, I'm definitely looking forward to that season. I hope the listeners check out Anatomy of Next and give it a listen themselves and see if they like it. You worked, I think on storytelling and narrative and book creation early on in your career, and that's what you studied in college. How are you feeling about the podcast format?

[0:46:16.1] MS: I love it. I love it so much, it's liberating. For me, you could probably tell by this podcast, I like to talk, I get excited about things and I start spinning on them. I love feedback. I love talking to other people. The interview – the interviewing of especially people smarter than me, and I get to do that now. I get to talk to just all these really fascinating people who've thought way more deeply about these things than I have.

Yeah, it's exciting. I love the conversational style. I love how many curious people I'm meeting, who are even just – people who are listening to the podcast, not even participating in it. Yeah, I've been enjoying it. I think that it's a more accessible medium, and I think it's also just – you mentioned this a little bit earlier. You talked about how new it is and how wild it is. People haven't really decided what the medium is going to be yet. I love that. I love feeling I'm on the frontier of something a little bit new.

[0:47:05.6] JM: Mike Solana, thanks for coming on Software Engineering Daily. It's been great talking.

[0:47:08.5] MS: Yeah, thanks so much for having me.

[END OF INTERVIEW]

[0:47:13.1] JM: The octopus, a sea creature known for its intelligence and flexibility. Octopus Deploy, a friendly deployment automation tool for deploying applications like .NET apps, Java apps and more. Ask any developer and they'll tell you that it's never fun pushing code at 5 p.m. on a Friday and then crossing your fingers hoping for the best. We've all been there. We've all done that, and that's where Octopus Deploy comes into the picture.

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