EPISODE 16

[INTRODUCTION]

[0:00:00.5] JM: Suddenly, automation is changing our world faster than anyone anticipated. For technologists, the world is becoming convenient and high leverage. For non-technologists, the job market is evaporating and things are becoming confusing.

Haseeb Qureshi and Quincy Larson join me for a roundtable discussion on automation, jobs, and artificial intelligence. Haseeb and I have had numerous discussions about this topic before over dinner, and Quincy is the founder of Free Code Camp which teaches people to learn programming for free. If there is one upside to all these jobs being automated away, it's that it will lead to massive user growth for Free Code Camp. I enjoyed talking to Quincy and Hasseb as always.

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Let's get on with the show.

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[0:01:37.6] JM: For more than 30 years, DNS has been one of the fundamental protocols of the internet. Yet, despite its accepted importance, it has never quite gotten the due that it deserves. Today's dynamic applications, hybrid clouds and volatile internet, demand that you rethink the strategic value and importance of your DNS choices.

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[INTERVIEW]

[0:03:32.5] JM: Quincy Larson and Haseeb Qureshi are returning guests to Software Engineering Daily. Today, we're talking about a variety of topics in this topic roundtable episode. Haseeb is currently an engineer at Airbnb and Quincy Larson is the founder of Free Code Camp. Guys, welcome back to software engineering daily

[0:03:52.5] HK: Thanks for having me, Jeff.

[0:03:54.0] QL: Yeah, thanks for having me, Jeff.

[0:03:55.5] JM: The first topic I want to discuss is automation, and you both have had conversations with me about this. Quincy, you write a lot about automation, your concerns; they get updated frequently. They tend to focus around the idea that a lot of people are going to be displaced by robotics, artificial intelligence. How are you thinking about automation and its threats to the social fabric these days?

[0:04:23.4] QL: I think automation is going to have the most immediate and significant impact on people who are ill-positioned to retrain themselves, people who are already really busy taking care of loved ones and people who are already working fulltime, heads down on whatever job they have right now. It's, unfortunately, soon going to be automated. Many of these people do not have a good baseline general knowledge. They probably haven't graduated from university. Many of them may have marginal literacy and numeracy. We need to retrain these specific people as soon as possible so that they can continue to work productively and care for their families.

[0:05:15.7] HK: Actually, let me make one point that I'm a little bit skeptical of some of the arguments that people have made that the increase in automation is going to require lots and lots of people to retain. I agree with that on its phase, that lots of people are going to have to retrain in order to be effective in an economy that rapidly is displacing a lot of what were previously manual jobs.

I also think it's kind of correct. I think this is an argument that a lot of economists have made, that it's not really realistic to train the majority of the population to be software engineers and it's quite likely that we're going to have to find some fundamental way to rethink the role of work in human societies at a place where the market can no longer — We can no longer really assume that the market is going to do a good enough job of just having useful roles for people who don't have particular sets of skills in the right geographic areas.

I think it's just going to be more likely that we're going to see enormous and rapidly accelerating inequality in even a first-world country like the United States as a result of automation. I think it's a much bigger social problem and a much bigger refiguring of society we're going to have to do rather than just hoping that somehow we're going to be able to retrain everybody into roughly an employment terrain that kind of looks like what it does today.

[0:06:38.9] QL: I would agree with that. I do think that's a little farther out though. My focus is on the next 15, 20 years, and I do think that it is realistic. At some point, we'll reach a point where there's just so little work to be done and the work that needs to be done by humans will be so specialized, it will be very hard. There will be diminishing marginal benefit to retraining at some

point. I think that's far enough off that we should definitely invest a lot of time and effort in training so we can kind of bridge that gap.

[0:07:17.3] JM: What about the automation of the white collared jobs? We hear about people talking about how lawyer is going to get automated, or accountant is going to get automated. To me, these are jobs that seem mechanistic to people like software engineers. If you zoom in and you actually look at the work that these people are doing something that account thing is actually much more complex and nuanced. This seems like a kind of area that actually will just be augmented and improved in quality by AI rather than having anybody be displaced except maybe some of the bean counters on the margins.

Are there white collared jobs that you guys see as being particularly vulnerable to straight up displacement?

[0:08:07.6] HK: I would say that — I don't know that I agree with the argument you just made because I agree with you in the essence of what you just stated which is that there's always going to be human lawyers, they're always going to be human accountants, because you need somebody at the helm of that. It's not really a mechanistic job, because there is also a human organizational political component to all of those fields. That said, is your company going to need 7 lawyers or will it just need one? That one lawyer Being augmented by very very Advanced algorithms that can essentially do e-discovery for them, or that can essentially collate giant pieces of data or basically intelligently review a contract much better than any human would be able to.

That sort of automation of what's, right now, a lot of sort of rank-and-file lawyer work, that is going to really radically change the proportion of society that can actually go and meaningfully be employed as a lawyer. You just don't need as many lawyers. You don't need as many accountants because so many of them are doing work that is essentially not technologically insurmountable to solve. Right now we're not there yet but eventually you can imagine with a human essentially leading a robot team — Not a robot team, but a team of AI, you can get a lot farther with a small fraction of the professionals working in things like accounting or law or anything similar to that.

[0:09:35.6] QL: Right. Just to follow up what Haseeb said which I agree with 100%, this is probably the most widely misunderstood aspect of automation. People worry about automation like replacing there entire job like lock stock & barrel. In practice what happens is individual practitioners of that craft or that field become much more efficient and you need fewer of them.

The team of 10 lawyers becomes one lawyer with really powerful e-discovery tools and really powerful templating tools, and a tool maybe something like Watson that helps them through a lot of different workflows. The consequences of that are going to be that only the very most skilled, or in practical terms, the most senior are going to be able to retain their job and the people who are newer to the field are going to get laid off.

[0:10:42.0] JM: Haseeb and I were originally poker players and that's how we met, playing online poker. This week I was researching Libratus, which is this No Limit Hold 'em artificial intelligence. When I was researching at, I realized just how much it was crushing the humans it was playing against. If Haseeb and I would have stayed ass poker players to this day we would be on the cusp of just getting completely eliminated from our jobs because this AI is just so thoroughly good at poker. While it is not in the wilds yet playing online, I'm sure that something like it will be out within a year or two or maybe it is already online, I actually don't know. I'm not completely up to date with this.

I find it interesting that this is something that 10 years ago, Hasseb, when you and I were playing, we would not have imagined, or at least I wouldn't have imagined that this would actually happen. I assumed, "Oh! No Limit takes too much creativity." Our framework for artificial intelligence 10 years ago, and we had no experience in computer science, obviously was pretty limited.

What are the implications of this? What are the implications of the fact that you actually can build and no limit poker bot that can just crush all human competitors?

[0:12:11.0] HK: I would say two things. The first thing I will say is that what it means for poker or online poker specifically is that I think what it clearly means your start online poker is not — this is something that anybody who's in the online poker space is already aware of, but it's something of a death now for online poker because what it means is that the only impediment to

something like this basically taking up every single seat at an online poker game is its ability to get caught by anti-fraud systems add poker sites. That's just a really really hard problems to solve a scale, is being able to detect a human versus a computer based on what are signals what are signals that are most easy to fabricate — If you have an online poker bot, it just makes a lot of money. If you can make a lot of money, you can afford to invest a lot fooling anti-fraud systems.

I think what that probably means is that the future of online poker player — Sorry. The future of professional poker players is it going to be live. It's not going to be online poker. Online poker it's already on the decline — For the very very high stakes, that is. For small stakes, it's still a different story. I think you're just going to see more and more of that.

As the stakes go up and the incentives go up to basically use very very advanced neural nets the that are essentially poker bots that can beat any human being, you're going to have to go to another domain to essentially get this more sportsman-like environment where I can ensure that you're not cheating or you're not doping or whatever the analog is for any normal physical sport.

The second thing that I would say is that taking the domain of poker itself aside, I don't think it actually tells us anything that interesting that we didn't already know when we saw AlphaGo beat the best players in the world at Go. I don't think you can take yourself seriously if you understand Go and understand poker and think that that wasn't a — That wasn't a judgment on essentially all games or all sufficiently constrained games eventually being susceptible to having world-class human players beaten by AI at this point.

It's already been here for a year. We should have already seen it coming that the reason why No Limit Hold 'em, Heads Up No Limit Hold 'em, didn't already have the best players in the world beaten by AI was because nobody was spending enough money to build one.

[0:14:28.4] JM: The game pieces in Go and poker are sufficiently easy to understand. The way that Libratus worked is they just taught it the rules of No Limit Hold 'em and then it figured out how to do things and it figured out how to win and create winning strategies. Do you think there are games — I mean I know you haven't played much Magic the Gathering. I don't think you've

played any Dominion, but there are these games that the different directions that the game can go in are so complicated that it perhaps is harder to describe to a computer. Can you imagine the game space like — Where is the boundary — Because we can say like Go and poker are very similar but obviously one is more complex than the other. One more potential games states than the other and you can imagine the game getting to a point where it is so complex that is equivalent in complexity to something that we really don't know how to solve yet, like being an engineer at Airbnb.

What is the dividing line between those games that are solvable with this approach of, “Here's the rules. Go figure it out,” and the too complex to master from that strategy?

[0:15:50.6] HK: The way we generally think about this is by thinking about the branching factor of the game, and the branching factor for those who are not familiar is basically the idea of if you imagine a giant a decision tree, the branching factor is the average number of branches that any particular decision branches into. The branching factor is two, you got this nice binary tree. If the branching factor is like 300, like it might be in something like Go. Actually, I don't think it's that big. I don’t recall exactly, but that's huge, and the final tree you end up with, there's no way you can search through every single node in that the gigantic tree.

I think before AlphaGo, we tend to think, “Oh, if the branching factor is high enough then you're screwed. There's no way beyond it.” I think we’ve seen that neural nets that can actually do a really good job searching through state spaces that have a very high branching factor. Poker is another example of this.

I guess the one thing I would say stop there are some games that encode other games within them that are much much more complex or encode other problems within them. I'm imagining some — Here’s an example of what you could call game, is basically like online dating scams. Online dating scams is like basically you have some fake person, you pretend to — I don't know. Maybe you're some scammer somewhere overseas. You find some fake person on OkCupid or match.com, or whatever. You pretend to be an attractive woman or an attractive men and you get them to fall in love with you and then you ask them to send you money.

This is actually pretty well constraint problem. There are clear inputs and outputs, but inside of that game is also the problem of natural language processing and also the problem of understanding human culture and human emotions, which is I don't think anyone even know how to encode that in such a way that a computer could traverse that decision space.

I think the encodability into a human readable decision space is a large part of what makes it difficult to solve some of these problems. Something like an AI or poker, or for Magic the Gathering, or Starcarft, so long as it's just a very discreet finite decision space that you can clearly render for a computer, I have no doubt that AI is going to basically master all of those domains.

The difficulty of something like an online dating scam or something like in the reviewing of contract is that it requires a lot of knowledge that sort of lifts up outside of the world of the PDF file itself or purely just the text that you've read of this person's profile or of the data that that's actually on OkCupid or match.com, or whatever. That's what I think makes it fundamentally difficult, is encoding data but we've never encoded, and don't even really know how to encode.

[SPONSOR MESSAGE]

[0:18:40.6] JM: Artificial intelligence is dramatically evolving the way that our world works, and to make AI easier and faster, we need new kinds of hardware and software, which is why Intel acquired Nervana Systems and its platform for deep learning.

Intel Nervana is hiring engineers to help develop a full stack for AI from chip design to software frameworks. Go to softwareengineeringdaily.com/intel to apply for an opening on the team. To learn more about the company, check out the interviews that I've conducted with its engineers. Those are also available at softwareengineeringdaily.com/intel. Come build the future with Intel Nervana. Go to softwareengineeringdaily.com/intel to apply now.

[INTERVIEW CONTINUED]

[0:19:36.7] JM: The reason I went from the discussion of what is going to be automated and how safe are white collared jobs to this discussion of poker is a lot of the intense deep learning research at a place like DeepMind, they look first and foremost at games and how do we solve games, complicated games like Starcraft, and I think that's because you can draw conclusions from the results of these studies of games being solved by AI. You draw conclusions around what is going to be automated first? What are the bellwethers of automation?

Quincy, like you, I am very concerned about the next 10 to 15 years. I think if we can make it over that hump we've got a real shot at getting to this glorious Utopia where people can do whatever kind of work they want and then get paid for it, or they don't even have to get paid most basic income or something. All that cotton candy dreamscape that we want to work towards, that's fantastic, but we got to make it through this stance 15 to 20 to maybe 25 years where there are people who cannot — Who are not productive given the current workscape.

When I was working at Amazon I would think about this question a lot. I was thinking about the question of like; is Amazon a job Creator or a job destroyer? I think it's just incredible creator of jobs, and I think it's as creator of jobs that are durable even through the age of automation. This is despite what people say about the robotics that Amazon is putting in its warehouses.

If you look at Amazon's core business; the shipping and logistics of purchased goods, there are all these edge cases that are kind of tricky to solve and are probably more tricky the solve than the well-formed type of games that were talking about that are going to be easy to solve early on, you have to handle these things like returns and restocking and all of the layers of human errors that can occur where — Just all of these different layers. Then, there's all these customer services associated with that. Then, every year they shortened delivery time, which means that they're tightening up processes across the board.

Quincy, when you look at the place like Amazon, do you see a potential stop-gap where you have these — Like I was talking about, coal workers, coal workers who don't know how to use email. They're just not technologically inclined, but they are hard workers and they did a great job in the coal mines but there's no more coal mine work. Can these people two fulfillment centers and the fulfillment center becomes sort of their retraining ground while they are doing a kind of work that they can still get paid for?

[0:22:32.4] QL: If Amazon we're willing to take a chance on coworkers, yeah, absolutely. I think, realistically though, in the United States at least, there's a very high rate of underemployment which is basically people who have educational attainment that outstrips requirements for their job. For example, somebody who has an undergraduate degree who's working as a barista at Starbucks would be like the classic example.

Why would Amazon necessarily go and hire somebody who's relatively low skill or maybe has skills that are simply not very relevant anymore, like raising coal out of the ground, when they cannot hire someone with a good general education, maybe a liberal arts degree who will in turn have a little bit more flexibility and never more baseline knowledge that they can use to relate new knowledge and more rapidly acquire new skills?

I would say that there's a big enough buffer of under-employed Americans at this point that those would be the first people you would go toward, not necessarily the people who went straight from high-school to the coal mine.

[0:23:50.1] JM: Do you have any idea how big the population of these type of people is, these type of people that don't have a pliant enough the way of doing work that they can retrain quickly and get some job that this new workplace can offer?

[0:24:09.2] QL: To put things in perspective, if you take a college degree as a rough barometer for the ability to adapt and change careers, which I think an undergraduate degree will instil upon the person who gets it pretty good pragmatic ability to adopt new skills end flex with the situation. I would say that there's only about a third of Americans who have a 4-year degree, so that leaves two-thirds who don't many of whom are working as truckers, who are working as coal miners, or working in declining manufacturing jobs, who will need to either go back and get the 4-year degree which may be plausible.

There are some great low-cost flexible alternatives for adults to do that, or we will be able to go to vocational program like a coding boot camp or a data engineering focused boot camp or some of these other specific skills that will help them. Maybe even just to customer service type boot camp, if you want to call it the boot camp. I'm not a huge fan off the term boot camp, but

basically a way that they can get quick on the job training that employers used to give people all the time. The training budget for most American forums has dropped precipitously to almost nothing. It's a shadow of what it used to be and the assumption is that universities are going to do all the training now.

What do you do when only a third of people have gone through university? You have to raise training budgets back up**.** I would love to see Amazon have really great training budgets and perhaps even work with the US government to get subsidies for those.

[0:26:02.7] JM: How much of this problem is a mindset problem, where if these people who are currently unemployable or who are even — Basically you're talking about this idea that there's a surplus of underemployed people and even if we could create more kind of semi technical jobs or low technical jobs that would be a little better, the underemployed people would be sucked up into those jobs first.

From my point of view, there is also just this mindset problem — Haseeb, I know you listened to the complacency episode with Tyler Cowen recently. That was too big thrust of what he was saying was just that people in America, there is a sense of complacency and it's not really like a lack of opportunity for retraining or resources, it's a mindset problem.

[0:27:05.6] HK: I would be very skeptical of that claim. First of all I would say that there are a lot of places where there is genuine lack of access to resources, to training to even having figures like Quincy, to be able to tell you like, “Hey, this is actually something that you can just do and it's completely normal to go out and retrain yourself and gain a new set of skills. There are a lot of places in American society and a lot of intersections of identity within American society that make that very difficult.

I would definitely say that I don't believe at all that it's purely a function of mindset. I do think that it has — I do agree with you that it has become more ingrained in our culture, there has been some stagnation kind of the entrepreneurial thrust that I think is necessary to thrive in a rapidly changing world.

I was just thinking as Quincy was talking about the shrinking of companies for training, really that's a large part of tragedy of the common type problem where everybody would like for everybody to be spending more on training. Nobody wants to be the one person spending that money, but the reason why I probably more companies could do that in the past was because of this assumption that different employee joins your company, they're likely to stay there for a very long time. You're very likely to reap the benefits of their growth as they develop as individuals.

With, I think, generations that tend to move between jobs more frequently and more rapidly and tend expect more, not just sort of more perks but also more meaning and more demanding, generally, out of their careers. For that generation, I can see why it kind of puts a lot of double buy-ins into the employment market, where if all candidates are essentially trying to stay for roughly two years and then do something else, it does make it very hard for companies to solve this tragedy of the commons problem of where do people get trained and how do you reinforce the norms in a society of, "Hey, you should experiment. You should try out new careers and learn new things because the world is going to change rapidly and you may not be best prepared for that by simply staying at your local optima which might be being the biggest, baddest coal miner in West Virginia or whatever**.**

[0:29:32.1] JM: Haseeb, you started off as a poker player and then transitioned into working a desk job. I kind of had a similar —

[0:29:42.3] HK: Sometimes a standing desk job, yeah.

[0:29:43.8] JM: Sometimes a standing desk job. Quincy, you started off — I think if I'm correct, you're first job out of — you worked at the school and then you gradually transition to an entrepreneurial role after you has saved up some money. You worked in education, you directed schools and then you gradually transitioned in entrepreneurship starting Free Code Camp.

I think all three of us have had different parts of our life where we have been working at home in a sort of self-directed fashion and then other sections of life when we're working in an office that's part of a team. I'm wondering how you two see those different modalities of work looking

back and then looking into the future of what is the best way for individuals to work, what are the trends that you're seeing? Quincy, why don't you go first?

[0:30:44.4] QL: I have been working remotely in my home or in various co-working spaces over the past four years. Free Code Camp doesn't have an office, we're an all the remote team. I have become very accustomed to just getting out of bed and going over to my desk and sitting down and starting working.

It took me awhile to get ramped up to that because the previous 10 years where I was working as a teacher and as a school director, I reported the physical office and I had that the extrinsic pressure, like I'm in the workplace environment, I'm dressed in a suit, I'm looking around and I'm seeing people who need me to help them do something or I've got the phone ringing and my boss is calling me, things like that. It was a pretty stark transition, and the way I handled it was moving into co-working spaces, that I won at various hackathons.

[0:31:44.6] JM: Actually, you won a co-working space.

[0:31:48.3] QL: I won desks at co-working space. One of the common prices you can get at hackathons and — Hackathons in San Francisco is free co-working space, for example, for six months at a space, and I did that I think two or three times and I've had two or three different offices that I worked out for free, which was really a nice perk.

I think for a lot of people, they need that extrinsic environment off; I'm in work mode, I have a coffee for burner, and a have the landline that rings occasionally, and I have my computer that's on my desk. Then, for other people, they really relish the flexibility of being able to wake up at 10 a.m. and not commute anywhere and then work until late in the evening and take breaks throughout the day.

I think working remotely is something that a lot of people can adjust to. It didn't come naturally to me, but over time I acclimated to it and now I'm extremely happy. There have been some studies; the most prominent was a study by Stanford where they looked at employees who worked remotely at a big Chinese company called Ctrip, which is basically like Expedia in China. Some of the findings, in short, where that people who worked remotely tended to enjoy

the work more. They tended to be more productive and they tended to get promoted less often, because they were, I think, invisible to their superiors.

[0:33:23.5] JM: I remember reading about that study and it's funny that — I don't remember taking away the conclusion that they didn't get promoted because they were around to play those kinds of corporate gamesmanship and jocking for the highest position.

Haseeb, what has been your experience with the two different modalities of work?

[0:33:45.7] HK: Yeah, it's been awhile since I was a professional poker player so I don't have the freshness that Quincy does or it's possible that if I was doing it again now I might have a different approach to it.

I remember the time when I was a professional poker player, because I started playing poker professionally when I was 16 years old. Essentially, since I ever did anything financially productive, arguably, maybe unproductive, I was always doing it for myself. I really had no — I had never worked the job and had a boss. That was totally alien to me, the idea of coming into a place where you had to be dressed up and say hello to people and good morning and like that. I never had that experience during the entire time that I was essentially self-employed.

For me, I was always actually really fascinated by that whole world and what that might be like to go and work in an office and have boss and have your success contingent on some kind of corporate political structure. Now, I've had that. I've been working for a couple of companies for a couple of years and I obviously know what this is like, and it's nothing particularly magical, but I would say that I think there are — from my own observations both about myself and about other people, I think there's an easy fallacy you can fall into and you talk about remote work, and I think a lot of people tend to make this fallacy.

It's the same fallacy that people get when they talk about nutrition, where they say, “There’s this study that shows this about nutrition, this study that shows that about nutrition. Therefore, here's what you should do, and you should also do this, and you should intermittently fast, and you should never eat carbs, and you should always have carbs, and you should do it every other week.”

I think the problem with that is that it's sort of assumes a — there's this presumption of a certain scientific model that there is one truth about nutrition and we're trying to discover the truth and once know the truth we can apply to everybody kind of across the board.

I think it's more and more obvious to researchers in nutrition at this point that actually there's no single truth about what nutrition is good for everybody because your epigenetics and your genetics generally and also just your environment and the way your body has kind of acclimated to different things affects what you should eat in affects the way the nutrition interacts with your body, it's a complex system. It's not something that's just completely determined by the fact but you're a Homo sapien.

I think the same thing is true for remote work versus working at an office. I think it depends on the company. I think it depends on the person period I think there are companies where remote work is probably completely just a nightmare and messed up and doesn't really work well at all. There are probably companies where it works really well and there are probably people would do really poorly when they work remotely and people who do really well when they work in an office. I think this idea that there should be one ground truth is just missing something really important about the landscape.

[0:36:44.7] JM: I think one thing we can both agree on when it comes to the working from home — or all three of us can agree on this. When it comes to the idea of working from home is the necessity of self-discipline and figuring out a daily framework that you can adhere to.

Haseeb, I remember reading your book, *The Philosophy of Poker*, and this idea of self-discipline is really a theme throughout the book and it almost — reading it, it really seemed like this was maybe perhaps the biggest lesson that you took away from poker was the idea that you really have to master yourself and mastering yourself as a holistic activity and then breaking down the specific silo's in self-mastery where it's like, "Okay. How are you getting enough sleep every day? How are you preventing yourself from tilting?" and figuring out all these things. It's much different when you're working at an office and you have a social schema around you that is enforcing certain things upon you.

I remember when I was a solo poker player, because I didn't have that social framework around me, I think it cost me to become a little bit screwed up at some point and really — that's why I ended up not doing so well at poker at a certain point. Think that's why I ended up leaving the game before you did perhaps, before the biggest aspects of the crash, because I really couldn't handle that solitude and I didn't get to that self-mastery earlier on.

[0:38:28.8] HK: I don't know that I didn't. I don't know that most of the people who are successful poker players do actually attain what I would consider to be self-mastery. I think I probably have more self-discipline the most people and I think that's a common refrain that I hear when people learn that. I live a pretty minimalistic life and I enforce a lot of constraints on myself.

I think the interesting thing sort of tying this thread back to the question of working in an office as supposed to remote work Is that I think the culture of working at an office is kind of designed for the average employee to basically maximize the experience of the average employee. If you're not the average employee then it's quite likely that the optimizations that are made for the average employee are not going to be particularly useful to you inside of an office setting.

I think it's very much true for me that I'm somebody who's — I'm intrinsically very very motivated by just getting lots of work done, and there are a lot of things inside if you work in an office that are actually not designed to optimize so much work you get done. They're designed to optimize basically your longevity and you feeling good about the company and you feeling happy and they work for the majority of people.

I don't know — things like celebrating everyone's birthday, or having frequent team off sites, or the kinds of things that you see at tech companies all the time that are — or having lots of meetings where you're celebrating everybody's wins and things like that. All of these things are clearly important, but they're also important for the average engineer. They're not important for every single engineer.

I can imagine for somebody like Quincy or maybe somebody like yourself who are probably outside of that median employee that you are not going to see a lot of value in a lot of those

rituals. In a way, those rituals aren't for you, they're for everyone else. That's one thing that I've certainly noticed. At the same time some of the structures that gets imposed by being in an office environment and being in a company culture, I do think is useful for me for structuring work, because that's one thing that I always struggled with when I was a poker player was enforcing structure on myself without having any external constraints.

If you're a poker player and you're not really feeling playing poker that day, nobody's going to make you play and certainly nobody's going to make you play well. Whereas if you're coming into an office and you're surrounded by people who are expecting you to perform at a certain level, that is enormously motivating for you to not just kind of slack off into nothing or about your work, or just not put in the kind of vigilance that you would need if a lot of people are depending on the work you're doing.

[0:41:13.6] QL: I would also add to what Haseeb just said that the best way to kind of create that sort of artificial extrinsic motivation that you could replicate by having an office where people are counting on you would probably be to make some sort of routine that is the product of a strongly enforced commitment, if you have some sort of commitment device like the equivalent of a swear jar. Every day that you sleep in instead of going to work that you somehow punish yourself and you somehow condition yourself into a state where you don't need those outside pressures to perform.

One book that I read that I strongly recommend to anybody who's considering doing any sort of creative endeavor, certainly if they're doing it on their own outside of an office environment, outside of some structure that's going to ensure their performance is the *War of Art* by Steven Pressfield. That book was pretty amazing for me. To summarize his approach, he sits down and writes four hours a day. He is a novelist and he worked as a taxi driver and did a whole bunch of odd jobs until his 40s when he finally got the self-discipline to sit down and actually start writing. His secret was just to write at least four hours a day, no excuses. By getting into that rhythm and sustaining it over years, he became very productive because 4 hours a day for him was a sustainable pace that he could commit to.

[0:42:51.5] JM: Quincy, I remember having this conversation with you a while ago when we were on the run after we had both some tacos and it was like a temperate California night and

we're having a great run, but we're having this weird conversation about this idea that — You articulated to me as feeling like a sense of disembodiment. You felt like almost like a disembodied ephemeral online presence, because you spend most of your day alone at home — Well, you're with your baby daughter who is getting older rapidly I'm sure. She can keep you some company and keep you anchored in the real world.

For the most part, much of your interaction, your influence with the rest of the world is virtual. You're spending your day at home on the computer totally silent. This is also how I experience the world, most of my day is spent doing research, being on the computer, creating podcasts and stuff then I engage people over the microphone like this. It's a very different sort of work experience than anything that I think people did 5 or 10 years ago or 20 years ago and it's kind of strange because you get an influence with thousands of people on a daily basis. Free Code Camp reaches tens of thousands of people but you yourself are somewhat isolated. Like you said, you almost feel like your existence it's almost — it's mostly online. It's like your influence in the world is mostly online. You could just be a disembodied brain in a vat somewhere and people would not know the difference between that and Quincy Larson. What are the psychic adjustments that you've had to make because of this mode of work?

[0:44:45.7] QL: I haven't really felt obligated to make any psychic adjustments if you will. I just got back from an incredible conference in New York City. I literally just flew in about an hour before we started talking, and it was so energizing to be around so many people in person, and it was this big conference put on by Saron, from CodeNewbie, and she did an amazing job of bringing a lot of great speakers together and keeping like a really high level of energy throughout the entire conference.

I probably had more than 100 conversations. I probably shook more than a hundred people's hands and learned more than a hundred names and tried to learn some of the stories behind those people and where they're heading. I remember after one of the long breaks where I was talking to people in the hall going and sitting down and being in that room over at Microsoft in Times Square surrounded by 300 people and I remember looking around and thinking like, "Wow! These entities that I interact with online, they're actual human beings. They are brains that are wrapped up in this body, they're atoms, and they're sitting around me in physical space. The absurdity situation didn't dawn on me that I was thinking in those terms which would be kind

of unthinkable for somebody even 20 or 30 years ago. Of course that's how it is, but for me it seemed like some massive revelation in the moment.

[0:46:17.2] HK: I think probably the only comparable experiences — I actually share some of that sentiment that you just expressed there, Quincy, that when I meet people who have read my blog or have heard my story and who may be who've heard some of my interviews on Software Engineering Daily, when they meet me, there's some sort of reality to it that I can't quite shake that's like, "Is this really me? Did you just read some —" they have this strange built up picture of who I am that it feels kind of divorced from my day-to-day life, but it's probably the same thing that I imagine if you were a writer back in — I don't know, the 19 hundreds or something. It was probably the same kind of relationship, where you write, you send off to one of your editor who you know and then one day you walk into a parlor and everybody there knows your name and maybe even knows your life story.

It is a very strange relationship to have with another person, it's the one where they know who you are and you have no idea who they are and somehow they know this part of you or they know you through this lens. It's something I've never quite been totally comfortable with.

[0:47:24.2] JM: Asymmetric intimacy.

[0:47:26.0] HK: Asymmetric — That's a really good way of putting it, yeah. That's kind of what it feels like to me, but I don't know. When I feel that I realize that I'm not super cut out from this, but I do it anyway because apparently no one else is.

[0:47:38.6] JM: It's probably only going to get weirder as time goes on and our ability to interface with lots of people and project our thoughts on to the internet to many people is going to get more developed, more enriched.

We talked about one side of the AI coin. Haseeb, I always like talking to you about all risk even though neither of us is very qualified to talk about it. I think you and I both share an aspiration to be well-versed. I think we're both gradually taking a more serious look at how does machine learning work, how does deep learning work rather than just kind of like brushing our hands against the contours of deep learning. We're really trying to get an understanding for what it is,

because we're realizing that most of the people that talk about it are just pontificating about it and then don't really know what they're talking about and it's really hard to draw a distinction between those pontificators are or and who the actual experts are. I think the only way to do this is to actually gain an expertise in it or gain some expertise in it so that you can understand what's going on. Since we're not there yet, we can still just like —

[0:48:58.2] HK: Yeah, let's pontificate anyway. Why not?

[0:48:59.1] JM: Let's pontificate, yeah. Okay. This AI risk stop, you and I both follow the philosophers that are talking about this a lot like Sam Harris and all the other people — the kinds of people he has in the show on his podcast, the Sam Harris Waking Up Podcast, and there's a number of other shows go into this and some great books about this. Basically, we're still in the pretty early days of discussing AI risk and understanding what AI risk actually means.

Yet, you have somebody like Andrew Ng who says that AI risk is as crazy as Mars overpopulation, and this specific quote something that I think about a lot. I'm like, "Why is it that somebody that is so deeply involved in the machine learning space can say such an extreme statement that is conflicted with many other people in this space who seem equally qualified, if not more qualified. Do you think somebody that is saying something like that, is it completely unfounded, or is he just trying to draw attention to himself. What do you think is going on there?

[0:50:15.2] HK: I can say definitely not the latter, but I would say is that first of all his claim that worrying about AI — worrying about AI risk is like worrying about overpopulation in Mars. I think that claim is kind of true and I wouldn't put it quite in those terms but I think they're not incompatible, the claims that one; really really far away from AI risk, or really really far away in a likelihood from a general AI, or AGI.

It may also be true that it is really important that invest right now in AI security, because when it gets there it could have catastrophic consequences if we don't. To me, I kind of imagine, let's say the year is — I don't know. Let's say that year is 1920 and people are just starting to put a lot of research into nuclear physics and you got people like Heisenberg or whoever. I forgot what the names of some of these famous physicists at this point who are kind of in the very early stages of figuring out all these physics and chemical reactions.

If someone were to say at that point, “Oh, worrying about the ethics of nuclear bombs i's like worrying about overpopulation in Mars.” They would have been right that they were still many years away from getting to the place where they could actually build nuclear bombs. They would also have been right —It would also have been right to say, “Yes, that's true, but once we get there we're going to be really glad that we had 30 years of talking about this on developing people's intuitions and thinking about safety mechanisms for nuclear arsenals that really have —” If you read some of the stories about how close we have been at times to essentially nuclear Holocaust of varying scales and we've only avoided them purely out of essentially accident is just — It’s kind of harrowing and it should tell you that, “Man! I really wish that people had been working on this for 30 years such that every single nuclear bomb that was ever built had just built into it really really robust safety mechanisms,” and it worked.

I think the concern is completely compatible to say like, “Yes, Andrew Ng, you're absolutely right, very likely.” I think you should take many of the cutting-edge researchers, you should accept their claims at face value, that yes it's very very hard to see how we go from where we are right now the general intelligence. There are tons and tons of problems that intervene between those two poles. I completely agree with that and that seems to me to be true.

That said, one; human beings really really suck predicting the pace of innovation. Sometimes we predicted to fast, sometimes we predicted to snow. If we predicted to slow, that might be disastrous. Second; even if — Let's say this is 30 years away. Let's say it's 40 years away, which maybe Andrew Ng would say it's a hundred years away. I think it's the kind of problem that given the amount of money that they spent right now on AI risk mitigation relative to AI research is probably more than, I would guess, at least ten thousand to one, if not a million to one.

In terms of the amount of funding spent on just researching AI and getting there faster, faster, faster to improving the state of AI as supposed to, “Hey, when we get there, let's make sure it's safe.” It is actually a really hard problem that maybe it takes 50 years in order to solve that problem. Well, let's get started now so by the time the second problem is solved we also the safety thing figured out. That's roughly the way that I see the difference between the people who

are calling for attention and fear, potentially, or caution about AI risk and the people who say it's very far away. I think it's likely that both of those narratives are true.

[0:53:57.9] QL: I would also kind of jump in and agree with Haseeb here. That's an excellent parallel between the time when we split the atom and when we actually had operational nuclear warheads that probably seemed like it would be a lot longer than it was. These are complex situations, complex technology. There's no way we can really forecast it with any degree of accuracy. We should adhere to the precautionary principle and we should invest time and money and public discourse in talking about how we should regulate this technology is.

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[0:54:46.6] JM: Catch bugs before your users do with full stack error monitoring in analytics, for developers, by Rollbar. With Rollbar's error monitoring, you get the full stack trace, the context, and the user data to help you find and fix impactful errors super fast. You can integrate Rollbar into your existing workflow. You could send error alerts to Slack, or HipChat, or you can automatically create new issues in Jira, Pivotal Tracker, or Trello.

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[INTERVIEW CONTINUED]

[0:55:57.3] JM: The last topic roundtable I did with Caleb Meredith and Courtland Allan, we started with the topic of Facebook, so I want to conclude this episode with the topic of Facebook. I had a lot of conversation with people about Facebook recently and I went to F8 this week, so I spent a lot of time thinking about it this week. How do you two use Facebook?

[0:56:29.2] QL: I basically just open it up end unfortunately Facebook's notification system isn't really robust enough for the amount of notifications I get. I'm not trying to brag. It's not because I'm like super famous and everybody wants to get a hold of me, it's just because I'm a member of too many Facebook groups and I'm a member of more than a thousand Free Code Camp Facebook groups. Every time somebody does anything in one of those groups, I get a notification. Basically, the notifications, I don't even bother opening it.

What I do so I open up messages because people will message me in Facebook and whenever somebody sends me something through another medium, somebody will email me I link to a Facebook post, then I'll open it and jump in there. That's basically the extent of my user Facebook both posting on Free Code Camp's Facebook page, which I control and checking my messages that people send me.

[0:57:35.7] HK: I would say my use Facebook is pretty comparable. I'm not quite on the scale of popularity that's Quincy, clearly, because my notification's tab is usually less than a hundred, I guess. I think Facebook wants you to use Facebook is like a sort of an extension of your social life and that's not really the way that I use Facebook and it's the way that I choose not to use Facebook. I don't write a lot about my life. I don't sort of you see it as a way to commune with people. It's really, for me, a platform on which, one; to be reachable, the share things that I think are pieces of content that people might be interested in, but it's not really about me broadcasting my life, and I'm totally fine with that. Facebook it's a good enough to be a flexible tool for different sort of cultural use cases.

[0:58:24.9] JM: Right. That's how I feel about it too, it's a tool. I was having a debate with a friend online recently, a friend who is not in tech and who is also not in Facebook and he was arguing that Facebook is this addictive thing and it's not a good thing. I was saying, "No. It's a tool." People who complain about getting addicted to Facebook are like people who are complaining about syringes, because they get addicted to heroin. You can't blame the tool for your own addiction to it.

[0:59:02.3] HK: I don't know that I would agree entirely with that analogy. I would say it's more of like blaming someone for getting addicted to gambling. Syringes obviously have a lot of really

important use cases and heroin is kind of an off-label usage for a syringe. Most syringe usage is for pretty good reasons.

For Facebook; Facebook is clearly designed and it was designed with a particular intent of getting people to use it the way that most people do use it, which is essentially as an extension of their social existence. Facebook has dramatically changed the way that a certain generation of people see themselves and see each other and connect to each other in society, and Facebook is also designed to be addictive. It's designed to serve a role that was the once taken up by other things in your life and that's how they make money. They make money by having your there as long as possible so they can advertise to you as much as possible.

I think to say that Facebook is just a tool is I think — It clearly is a tool, but to say that it's just a tool I think is saying that gambling it's just a tool because you can make money out of it and be a professional poker player. You certainly can. I would say that if you look on the whole, gambling tends to have pretty deleterious effects on the majority of the people that you're going to see in a casino in a given night. you and I actually both experienced this if you've ever been to Vegas and you walk around the slot machines in a casino, what you don't get this a sense that these people are using a tool particularly well. What you feel is that these people are being exploited by something that is designed to exploit them.

It was a very very very craftly designed by some of the smartest people in the world to optimally exploit them for as much money as possible. It seems to be like a better world would be one where that maybe it didn’t exist or the incentives weren’t there for that exploitation to happen.

[1:01:03.2] JM: Maybe, but for you and I, gambling was a tool for antifragility. We grew up in the flames of poker and those emotional difficulties that we encountered as poker players as gamblers, building up a resistance to the psychological brutality that daily gambling wages against your brain actually has tremendous value later in life.

Perhaps more people should be gambling at a younger age because it helps you develop antifragility. The world is a place where things will be beckoning to you with addictive tendencies; whether it is your smartphone or Facebook or email or Twitter or anything — or heroin, and you have to avoid these.

Obviously, heroin is a little bit different because it's like people invite you to be on Twitter, invite you to be on Facebook and you have social pressure to do that and it's socially acceptable social pressure whereas nobody is offering you the heroin and saying, “Hey, you really really need to try out this heroin and connect with me on heroin.”

[1:02:18.6] HK: I think actually some people sometimes do that. The claim you're making that poker or gambling, generally, basically it can bear all these fruits and if you only take the right approach to it or you learn right lessons from it, then you can extract this fruits the same way that Quincy and I can extract some fruits on Facebook without completely subsuming our lives into it.

That's true, and I take your point. Your point is well-made, but what I would say is that I would say that for the average poker player, I think if you actually look at what does a life of poker actually to the average person who plays poker, I would say probably on average it's negative or close. I would contend not the same thing it's likely true for Facebook, that the average person who spends a large amount of their time on Facebook probably be that's not have marginal Improvement in their life relative to if they had not — Before they had invested their identity so much in to Facebook.

That's Facebook should not exist. That's not what I'm arguing. I'm not arguing that it needs to be regulated or anything like that. Again, I don't think those claims are incompatible. You can say that there's a lot of value to be had out of the social network or out of something like Facebook or Twitter and I think you can also say that the average person is not likely to extract those fruits. On average, if you're somebody who is using Facebook or Twitter a lot, chances are it is producing a net-negative in your life

[1:03:52.8] QL: I would definitely echo that sentiment and I'd like to just add on the topic of poker. This conversation is very much the victim of survivorship bias. Two out of the three people in this call had a positive experience, or I would say positive at least financially experience with poker. Facebook, I think all three of us have benefited greatest from Facebook as a tool to communicate with people. At the same time, I know plenty of people who or sitting around, moping around the apartments probably miserable because whenever they open up

Facebook which is the average Facebook user uses at about an hour a day, they're just seeing all their friends out partying and having a great time and they're seeing all these great accomplishments and they're feeling inadequate as a result. They're like, "Why is this my daily life?" They look around their apartment and they think, "This is my daily life," and then they look at Facebook and they see all these amazing things happening for other people.

Really, what they're seeing is like the highly polished highlights of other people's lives. I think there may already be a lot of research that document how this can cause depression. Certainly, on the note of comparing Facebook the casino just like there were a whole lot of geniuses and a whole lot of time and energy spent on maximizing the efficiency of casinos and their weird carpets and all these other things for distracting and steering people over the slot machines, Facebook is the same way. They have a huge team of user experience designers, they do a ton of A-B testing, and their goal — make no mistake. The goal of Facebook is to get you to spend as much time on Facebook as possible, because that's how they make their money is through advertising to you.

If you read excellent new book by Tim Wu, the same guy who coined the term net-neutrality. He wrote the book recently called the *Attention Merchants*, and he has an entire chapter dedicated just to Facebook. I definitely think that Facebook is a dangerous thing, and for many people it isn't that negative. If in the right hands, of course, it's net-positive. I definitely think Facebook is a net-positive. For me, it's definitely a net-positive for many of the people in the Free Code Camp community who use Facebook's groups functionality. It's definitely a net-positive when I can go there and announce some big life change and my entire extended family who happen to be on Facebook can see that.

I think the main problem with Facebook is their incentives are not aligned directly with us. They built the tools to attract us but there's also a whole lot of other negative stuff associated with that that a less vigilant person would fall prey too.

[1:06:47.8] JM: I want to thank you both for coming back on Software Engineering Daily, a lot of interesting topics, basically nothing relating to software engineering directly.

[1:06:58.7] **HK:** We did get to talk about heroin though, so close enough.

[END OF INTERVIEW]

[1:07:02.6] JM: Thanks to Symphono for sponsoring Software Engineering Daily. Symphono is a custom engineering shop where senior engineers tackle big tech challenges while learning from each other. Check it out at symphono.com/sedaily. That's symphono.com/sedaily.

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