

[Transcript] The Realignment / 370 | Timothy B. Lee: Why Artificial Intelligence Won't Cause Mass Unemployment

Marshall here, welcome back to The Realignment.
Hey everyone, welcome back to the show.
We've got a bunch of great episodes coming out this week,
and before we dive into this one,
a quick reminder that SawGram my next Q&A
slash AMA discussion episode
for our Supercast subscribers is out this Friday.
If you'd like to subscribe, support the show,
submit your own topics,
and of course listen to the full episode,
go to realignment.supercast.com.
On to today's episode,
speaking with Timothy B. Lee,
author of the Understanding AI Substack.
There's obviously a lot of demand,
interest in the AI topic,
but a lesson I took from the Web 3
slash crypto and metaverse excitement
over the past few years is the need to balance
earnest interest with, let's just say,
inclination against leaning too far into the hype.
Last month, Timothy wrote the perfect piece
that hits the balance between those two things.
It's called Why I'm Not Worried
about AI Causing Mass Unemployment.
Software didn't need the world and AI won't either.
This is linked in the show notes.
As you'll hear, his piece and the conversation we have
really builds on a previous Realignment guest,
Mark Andreessen's famous
Software is Eating the World essay from 2011,
also linked in the show notes.
Timothy and I leave things excited about the future of AI,
but also recognizing how the 2010s demonstrate
the limits of digital's ability
to fundamentally change the physical world.
TLDR, your job is probably safe for now.
Huge thank you to the Foundation for American Innovation
for supporting the podcast's work.
Hope you all enjoy this conversation.
Timothy Lee, welcome to the Realignment.
Hey, thanks for having me on.
Yeah, so given the title of this episode,

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focusing on your piece, really poo-pooing the idea that AI will just eat the entire economy and lead to mass joblessness, I think it's actually important to start from the top with the fact that you do believe that AI is a very big deal as a category, as a space. You're writing a dedicated newsletter. Focus on the topic. So I'd love for you just to start with your just articulation of the fact that over the past 15 years, there's been a couple of technologies that have really impressed you. Obviously self-driving cars, voice recognition in the 2010s, but nothing was as impactful to you as first using chat, GPT-3. So can you really just articulate that for us to understand how we're not just trying to just dunk on AI but rather provide nuance? Sure. I mean, I think there's a wide range of possible levels of importance. So you think about, was the internet important? Like obviously it wasn't an unimportant technology that had a lot of impacts on the world. It just didn't have as big of an impact as some people thought it would in the 2010s. And I see AI similarly. So absolutely, I think every cultural industry is going to have really big impacts from AI. I think a lot of other professions are going to have to change. So it'll have big impacts on the economy and on society. But I think some people are making really strong cases about basically we won't have any jobs left or like many, many people will end up unable to find work because of AI. And I think that's not true. I think it's more the case that this is a continuation of a process we've had for many decades where new technologies come along. They change a lot of jobs, eliminate some jobs, and then other jobs come along for a place that I think we're likely to see that process continue in the coming decades. And what about chat?

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GPT-3 really impressed you so much.
Relative to, once again, like self-driving cars, Siri,
Alexa, et cetera,
what really just stepped it up for you?
So yeah, so I would say over the last decade,
AI technologies have continuously kind of exceeded
my expectations.
And I always thought it was theoretically possible
that in some number of decades
that there would be kind of human level AI.
But I always thought that one of the hardest things
for a computer to do would be to understand natural language
and to understand the complicated concepts
that human beings use.
And there's a lot of arguments about whether AI,
whether large language models, quote unquote,
really understand concepts.
But if you ask it a question about a complicated topic,
about a top policy topic or a scientific topic,
it very clearly understands, in some sense,
how the ideas relate to each other.
And you can do it flexibly if you ask it to do something
in the style of some particular person
and understands the nuances of what that person understood
or how they spoke and stuff like that.
And that was just something, if you'd asked me 10 years ago,
what's the hardest things that computers could do?
I would have said that that's harder than most of the other things
people are trying to get computers to do.
And so the fact that it did it makes me think
that we're moving along pretty quickly.
And human level AI might not be very far away.
And I'm curious, when you think about making evaluations
or quasi-analytical predictions
about how a technology is going to impact a space,
how much does the specter of Paul Krugman in the 90s
saying that the internet wouldn't have more of an impact
than the fax machine kind of haunt you?
Or that ANOS who said, you know,
Amazon just wasn't going to work out in 2001.
Like those are always the two examples
that people in the tech industry sort of bring up to say,
well, listen, we've dramatically underestimated

these technologies before and critics are often making or even skeptics are often making a similar mistake. So how would you differentiate kind of the, I'd say the dose of realism you're trying to offer from the Paul Krugman 1990s era? I mean, I think that there's obviously a lot of uncertainty any time you're prognosticating. I was certainly one of the people who thought they could move more quickly than they did in the late 2010s. So it's very possible I'll be wrong, but I do think that this is kind of a movie we've seen before, that there's been since at least the 60s probably earlier that predictions that now robots and automation are getting so sophisticated that we're going to see large-scale job loss and that hasn't happened. And so I think that, again, I think it's going to be big. It's just not going to be so big that everybody's out of a job. So this really takes us to 2011. Obviously, everything that a VC writes is going to be to a certain degree like propaganda, like you're operating a business, you're trying to make money. But I think Mark Andreessen's software is eating the road essay mixed just his need to make money with actually making a serious argument about how technology was going to impact the course of the rest of the decade. So can you really just start by explaining why Mark's essay software is eating the world? It's like a really useful place to start our conversation here about the impact of AI on the job market moving forward. Yeah, absolutely. So I think Andreessen was writing in an interesting moment where there'd been a 10 or 20-year period before that where people like Paul Krugman just said none of this is going to work. And by 2011, it was very clear like Google was a big thing, Facebook was a big thing. It was very clear that from an information technology perspective, the internet and these tech startups were going to be a big deal. But then Andreessen kind of went forward. And one quick thing to add too, which is that you then have everyone having an iPhone too. So like the step change of the desktop laptop to mobile too. Right, yes. And so there was a ton of happening.

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It was very clear this was going to be a big deal.
But there was a question of like how big a deal.
And Andreessen's view was just as Netflix was
was disrupting Blockbuster and iTunes and Spotify were,
I guess Spotify was just new then,
but we're disrupting the recording industry, et cetera.
His view was, well, we're going to have the same thing happen everywhere else
to education and healthcare and transportation.
And because those industries are bigger than music or movies or books
or the kind of entertainment industries that the internet disrupted,
then these new companies maybe are going to be even bigger
than the existing companies.
And I should say, like I was pretty sympathetic to that.
If you look at what I was writing in the early and mid 2010s,
I wrote a lot of pieces that, for example,
I argued that I thought Uber's pretty high valuation was justified
and then it might go higher.
So I'm not saying that Mark Andreessen was an idiot
for having made this prediction.
Like I thought some of it was plausible.
But yeah, I think it just did not turn out to,
that's just not how it turned out.
Yeah, and I think the way to understand a couple of these different categories
were obviously Andreessen and A16Z's investment in Airbnb.
So like that's the hotels.
You have the investment in Lyft.
That's transportation, taxi industry.
And then you have the investment in Coinbase,
which is crypto, which aside from just sort of the,
let's just say like late, early 2010s cringe around,
you know, Web 3 is really just about changing the actual rails
of the global financial infrastructure.
That was the really substantive part of that argument.
How would you assess success in those three?
This is what you write about in the piece.
Like how would you assess success or what's to say like,
I won't even say failure, but just sort of how did,
how did the thesis play out in those three categories?
Right.
So I would say of those three, Airbnb I think is clearly the most successful.
I mean, that is quite a successful business.
It's now, I think it's got a 70 billion market cap somewhere around there.
And it is as big as some of the largest hotel chains.

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So by any measure, that's a successful company.

It was a good investment by Andreessen Horowitz.

But it's not like, you know, like Netflix putting blockbuster out of business.

Like, you know, the existing hotel chains are still there.

They're doing fine.

And Airbnb is kind of a new entrant into, you know,

what's a, what's a pretty healthy traditional hotel industry.

I think it's similar for Uber.

But I think like the taxi business is just a really difficult business because it's so labor intensive and there's really not that much demand for taxis in the grand scheme of things.

And so again, I think it's, Uber in particular is a successful business.

It's likely to continue to be successful, but that's just a small market.

And I think Uber had visions of growing that into like a larger kind of transportation as a service thing where like everybody's transportation would somehow be via Uber and maybe everybody would give up their cars and do Uber.

And part of that was about self-driving cars, which, which haven't happened yet.

But anyway, it was just, I think it's just much smaller.

Like the people that invested at a 70 billion valuation five or 10 years ago were expecting, I guess it was seven years ago, they did that.

We're expecting obviously to get much more than 70 billion and we're now about there.

So the last people who invested in Uber have not made a good return.

Coinbase, I think to some extent, the jurors still out.

There certainly are three people out there who say it's like still going to happen.

And I certainly, I was pretty bullish on Bitcoin 10 years ago, but people are not, you know, ordinary people are not using Bitcoin for ordinary transactions.

There are, there are kind of Bitcoin hobbyists that use it for various things, but the idea that it's going to displace the conventional financial system, I think it's much less plausible now than it was 10 years ago.

Yeah.

And I think what's really interesting about a couple of those examples is when you just really see the limits of technology to just solve underlying problems in the sense that guess what technology is able to do when it comes to Airbnb, it's capable of just making the booking process just infant, like just a trillion X easier than it was in the 1980s pre-internet.

But at the end of the day, that isn't going to underlyingly address the unit economic issues, the cleaning cost problems, the fact that cities are still going to have like limitations on the different direction.

And it will also mean that, you know, and this also applies with Uber and taxis.

I remember, you know, I mean, I lived in DC during the 2010s.

After Uber came out, it suddenly became possible to actually use a credit card in a taxi cab instead of just the terrible system where they would claim, Oh, it's broken.

You have to get cash.

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That was an actual example where Uber at a brand level kind of pushed the incumbents to improve their service to the point where I'm totally comfortable using a taxi.

I mean, I wasn't before.

So that's just an interesting limit there.

So the next thing you went through during the essays is you actually kind of went through different, not just like companies like we just described when it came to a 16 season investments, but you actually went through at an economics level, looking through different industries were quote unquote, there was success during this period.

So I'd love to actually just break through each of these.

So the first of which was, you know, social networks and messaging apps.

This means Discord, Instagram, Slack, Snap Zoom, WhatsApp, et cetera, et cetera, et cetera.

I think the interesting point that you make is these were areas that were always just software.

So really just talk about what you meant by that.

Yeah.

So the soft reading the world thesis was you're going to have a traditional industry that was not a software industry.

Like, I mean, Airbnb and Uber, I think were the examples he had in mind and he thought they were going to be any more of those.

But yeah, you think about a company like Slack, you know, that's a messaging app that's replacing other messaging apps.

And so the total amount of like software in the world is not necessarily going up very much because people are largely switching from something else to Slack, something else that's kind of digital.

I think that's true for all of those companies.

And the next category would just be, you know, Square, Stripe, Robinhood, Venmo, like how does that kind of, once again, successful companies, but that isn't quite the eating the world step change.

Yeah.

So again, it's definitely progress.

I mean, I think that I use Stripe for my newsletter and it's a very good product.

But basically, it is a nicer front end for the payment rails that have existed for 50 plus years.

The credit card payment network, Square is the same way.

And Robinhood, I think is largely a new front end for stock as opposed to, you know, the next thing you're probably going to say is the blockchain based ones.

So like the vision of the blockchain people is that instead of having Robinhood, people will like, companies will like issue shares on the blockchain and you'll have some kind of like internet native ways to record ownership and exchange shares.

And that's not what Robinhood is doing.

Similarly, you know, the Lightning Network, you can use the Lightning Network to make payments.

The vision there is that maybe we don't need banks at all because people, you know, will

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have some kind of hardware wallet and they'll make payments directly.

That has not happened.

And so, yeah, it's, it's obviously the, and it just as, you know, when phones are invented, people could start calling their bank and making like transactions over the phone, but it was people's dot banks that were basically like they used to be the same thing that the internet gives us a new way to communicate with the banks and tell us our banks what we want to do.

But we still have basically the same banks that operated it basically the same way they did, you know, 20 or 40 years ago.

And the last category we haven't discussed is really just the broader sharing economy. So like the, you've got Airbnb, Uber, those are just the even pre 2011 standouts in the category.

Even have a bunch of companies, Bird, DoorDash, Instacart, Lime, WeWork, et cetera, et cetera. Like what kind of happens in that category with those companies?

So I think what happened was people looked at Airbnb and Uber and thought there's going to be a bunch more of these and they basically weren't.

I mean, so the scooter companies, I think now are pretty much failures.

There's a tiny fraction of their initial investment.

WeWork was a total failure.

Food delivery companies are fine, but they're not, I don't think they're huge successes for investors.

And they, you know, it's definitely more convenient than like getting a pizza delivered, but you could get a pizza delivered 20 years ago.

So that's a pretty small change.

I mean, you think about in the 2010s, something that happened pretty often as people launched a startup that was like the Uber for X.

And not only can they not think of anything that was successful, like I've probably been remembering what they were.

I mean, I know that was like a, you know, a cliché that everybody was starting an Uber for X company.

But it's like, yeah, it's hard to even remember what those companies were.

Like I don't think any of those companies were at all significant, which, you know, again, doesn't reflect badly on Uber.

Like Uber itself, I think is a pretty significant company.

But that was just kind of a, I think that was an unusual opportunity to disrupt one specific industry as opposed to like a new pattern that would be repeated all across the economy the way I think Andrews expected it to.

And I think this is where it gets really interesting, especially from a politics and policy perspective, the area where you, others, et cetera, who just agree.

And actually, frankly, a lot of, you know, a 16s American dynamism practice I've interviewed Catherine Boyle a couple of times is kind of premised on is the idea of it.

This just did not work in healthcare and education.

How do you look at those categories in terms of, or there are any like missed opportunities

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you saw or is there anything where you're just sort of like, oh, like in 2013, this could bend something, but it didn't become something.

How do you think about those two categories?

I wouldn't say there were missed opportunities.

I mean, look, there are companies.

There's Udacity.

There is Lambda School.

I think it's not called Bloom Tech.

There are, I think there's like a master class thing that does like YouTube classes.

So there are people building various kinds of online.

You can maybe put Khan Academy in this category.

There are people building internet centric education platforms.

And like I have no like really beef with those platforms.

They seem like good ideas.

I'm sure that they're providing some value to some students.

But again, I guess it's similar to Airbnb.

It's like a new entrance in the education market.

That's just one more option that a few people use, but like most people are sending their kids to K-12 schools and then they're going to college.

And they just, I think that the Silicon Valley just underestimated the value proposition that a traditional school where you go face to faces.

And I think we really saw this in the pandemic.

I mean, if the kind of Silicon Valley thesis had worked, you would have expected Zoom school to work better.

Or maybe, you know, one of these other options would have taken off since people didn't have the option to go face to face.

But I think people really like to go.

They like to go to a face to face lecture.

They like to meet with their friends.

They like to do extracurricular activities.

They like to have study groups, all that kind of stuff.

And that just inherently requires being on a physical campus or in a physical school building.

And once you're doing that, like it's, you know, there's only so much in it, the internet and software can do to improve that experience.

Health care, I actually do think there are significant ways that software has improved health care.

Most, I mean, in the kind of devices and pharmaceuticals and those kind of places, I mean, certainly pharmaceutical companies use software to do modeling and, you know, data analysis and stuff to figure out what drugs to make.

And certainly there are many medical devices that have software in them.

So, yeah, so certainly I think software has been important in that industry.

But what you don't see that is completely new healthcare providers, right?

There's no like Silicon Valley hospital chain that's replacing Silicon Valley or some smart phone app that you don't have to go to the hospital, except in pretty limited situations.

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The vast majority of healthcare spending is still being provided by traditional medical practices, traditional hospitals, traditional, you know, clinics.

And so forth. And, yeah, so far there's just isn't, I just don't see any sign that anybody's figured out a different model that kind of makes those traditional institutions irrelevant in the same way that like Harvard is still the best university.

It's not, you know, there's not some other and there's not even anybody, you know, the top 50, if you look at the top 50 universities are all basically the same universities you would have had 50 years ago.

Whereas if you look at the top, you know, at the way like people like acquire music, like the things that were on the top in a tower record is not on the list anymore because they're like totally out of business.

So it's just a totally different scale of impact.

Yeah, it's just interesting hearing you articulate this. I think I'm actually so speaking of like newer chains I use one medical.

And for my like healthcare needs and I use like 10 one of them in New York for my dental needs but in one medical was acquired by Amazon but at a certain point that's a new brand entrant.

That's just in the same way that Airbnb is a new brand entrant to the hospital to the hospitality category but the claim, if you're thinking about the transformative needs potential technology is not that you could create new brands you obviously can always create new brands.

The question was, are you fundamentally going from horse and buggy to automobile fax machine to, you know, internet, etc. etc.

Okay, so we spend a lot of time.

Well, one other example is I've seen some YouTube ads for a company called forward I think it is.

It has a chain of primary care clinics that I was reading a little bit about them they do things like they do much faster diagnostics so you go in and you get your blood draw and then like you get the results before you leave that kind of thing.

So you can imagine a world like like I think a way you could prove and recent thesis right is if that became really popular, and they're growing very quickly, and they kind of took over primary care and then they say okay now there's going to be a forward hospital or there's going to be a forward insurance

company or something like that, where, you know, that became like a major player in healthcare, and kind of an alternative where you didn't need an insurance, a traditional insurance or you didn't need to go to digital hospital.

Okay, like, that that's the top rating is the world thesis was correct in healthcare. And I don't mean for it's still around, maybe they'll be successful but so far they seem to be a relatively minor option, alongside the kind of traditional as opposed to like a totally

new thing that is maybe going to put hospitals or insurance companies or whoever out of business.

You've been right about this in the essay we've you know you spent a lot of time in the essay slash the newsletter, and we spent a lot of time in this conversation like unpacking this 2011 VC thesis, which once again to Mark's credit very little in that space is

revisited 10 years later so it's just it's once again like well written, like very interesting like they're like falsifiable and not just sort of like bloviating claims. Why do you think AI predictions specifically about mass job elimination are making a similar.

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Actually, no actually when we take when we take one more step back like, I guess the question is, what would you say is the central.

The central reality that Mark got wrong which I think you basically said about extrapolating Uber and Airbnb to other categories that seem to be the central quote unquote problem here right.

Yeah, so I think that sounds kind of but all but like the fundamental issue is that the physical world is very complicated, and that fundamentally most products in the economy are not information based like if you buy a house.

You know, yes, the builder, you know had an IT system and used email and stuff but like the bricklayer is not that's not a software product that's like a physical bricks and mortar process.

And, you know, similarly when you go to the doctor, like yes the doctor like keeps keeps his or her like medical records in a computer but like the actual service they're providing is not an informational service.

And so most of the economy you know haircuts, most of the economy is not informational in nature.

And so that just limits the amount of the size of the impact that an informational product can have on the economy as a whole there be some industries like movies and music and.

You know catalog shipping and stuff like that work and have a big impact but there's others where I can.

And then the key thing here is, you're kind of claiming this piece then is that what you could see happening is folks are making the equivalent you be helpful to think of, you know, stable diffusion. Chat GPT three like these like you know language learning models that everyone's very excited about right now entirely justifiable. You could see a world where people are taking those two examples and over extrapolating from them, and the way that you could over extrapolate from the very legitimate

success of Airbnb and Uber really expand on that for us please.

Yeah, absolutely. So I mean, I think part of it is just the kind of people who write these kind of essays. So like my job, I sit in front of computer I type things, I publish it other people click on them and share them and so it is very plausible that pieces of my job could be automated and you know I could be out of a job in 10 or 20 years.

You pause real quick though, because this is actually where it gets helpful. Like what is your job then like what is your job and why would you see yourself out of, I guess maybe in 20 years, I want well written AI and economic takes but not at the production

speed of once a week, but like five times a day because the AI is that is that like how it's hard to say listen so I'm I'm self employed. The newsletter I'm not charging it so my mind a little weird but you know a couple years ago I had a job at a traditional news organization.

Yeah, you could imagine news organization needs to publish a certain number of articles and human workers are expensive and so if you could build a large language model that could produce Tim Lee quality news articles that have that who are you know factually accurate and have the level of insight that

my mind does, you could theoretically imagine that you just, you know, have the software do that and then they can lay off the people and save a lot of money now, I think news in particular gets really weird because it's an if it's a

they're fighting over audience share and so if everybody has Tim Lee quality essays and maybe that becomes a commodity and doesn't make any money and there's something else so it's

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And then if it's a commodity, then Tim Lee at a brand level is actually a value add I particularly like you Tim Lee more than I like this other person this this that quite possible yeah so I mean that gets weird so I think a more like reasonable example would be like you don't care which account you got you just need the right answer. And so if you had software that could do, you know, human level accounting is very plausible and most people would switch. I think there are a lot of informational you know think about lawyers think about management consultants. There are a lot of industries were plausible at least big part of the job is something that you could automate.

Yeah.

And this is where it gets interesting and I think folks are starting to make this rhetorical and conceptual pivot but if I'm thinking about late 2010s AI discourse automation discourse.

This is kind of like in the Andrew Yang space everyone's talking about how truck drivers are this here and they are are this are this huge like backbone of whole parts of the American economy and those jobs just going to be like automated away, or you're talking about, you know, we're going to need

this UBI because this this this that it's interesting how the conversation has shifted from like a very like blue collar working class category to like that white collar direction.

Could you kind of like comment on just like that evolution over the past five years like what basic what didn't happen that made us we're just not talking about like we're not talking about we're talking about a truck truck driver shortage.

Yeah, actually not like a literal number of like unemployed people in Ohio.

Right. So I mean basically what happened was that five years ago people were working on self driving cars and optimistic that they would be ready soon and that didn't happen.

And now people are working on large language models, which is, you know, a different application that that competes with a different set of workers.

I mean, I would say even with the with the self driving cars, I think people are overestimating the trucking thing.

And partly because it would take 10 or 20 years, I think we'll take if if they perfected tomorrow, it'll take 10 or 20 years just to kind of turn over the fleet and install self driving technology and but also the a lot of the workflow.

So like something that a truck driver does, especially the kind of short range truck drivers like delivery drivers and stuff.

Like if you are say you are a Pepsi Cola distributor, you drive up to a store and then you unload your cargo and put it in the store, I believe often the truck drivers job to do that.

And so you couldn't just drop a self driving truck in because then, you know, you'd have to change everything.

So maybe the store owner comes out and loads it or whatever.

So I think there will still be a quick thing.

We'll go into this later because the other thing you could say as well, if AI is that advanced, we're going to have like a robot do the stacking.

We'll get into that later why that's actually incredibly difficult.

But you see that exponentially scale and difficulty just staying it out loud.

Yes, absolutely. Yeah. So that's so right.

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So that was the focus because I don't think people like we said before, like I was surprised by how the language models was.

The assumption was it's just going to be decades and decades before an AI can like write a competent essay and or memo or whatever.

And now it appears that maybe it's going to be just a few years because it's gotten much better in the last just the last two or three years.

So I guess the real question is you kind of lay out three different underlying realities that should shape.

Actually, this is good news.

I think this is good news for most people unless you own a AI company that should give us some optimism about all the jobs not being eliminated.

Just the fact that robotics is just such a desperately difficult space.

I kind of hinted at this with the whole like you're not going to just be able to have your, you know, AI driven truck and then there's a AI driven like mecha suit, you know, not mecha suit, right?

But like a robot in the back was stacking like why is the robotics side of that so difficult?

So I think part of it is just like the human body is like this engineering marvel.

If you just think about your hand, it's got, you know, each of your, each of your fingers have multiple joints in them and we've got like these various fine sensors and we can do very like intricate motions.

And right now I think we just don't have the like hardware to like anywhere close and it's also self repairing, right?

If you get a minor cut, it like heals itself.

Whereas with the robot, if the robot hand breaks, like you need to repair it in that probably is going to require a human worker.

So one of the leading robotics companies is a company called Boston Dynamics.

And a few months ago they put out a video of a humanoid robot doing some construction tasks.

It was like picking up a box of tools and handing it to somebody on some scaffolding.

And Ron Amadeo at Art's Technica pointed out that if you look closely, the everything the robot grabbed had a little dense in it because the robot just has this like simple,

simple claw with like not very, very, you know, doesn't have a fine motor skills and was like grabbing it too quickly because it doesn't have any sensors on its hands.

I mean, that's one of the leading companies in the world.

So I think it's going to take a long time to build robots.

And like also like the feet are very important because like, you know, my house, you think about a plumber, my house has multiple stories.

And so when a plumber comes, they need to climb the stairs, which means any robot that would do the plumbing job would need to be on two legs.

And then when you have a robot that has to walk makes all the everything else more complicated because, you know, it's a little unsteady.

And so you need to have more like actuators and sensors to make sure you're balanced.

So it's just a very complicated problem.

I'm not saying it's never going to be solved, but it's clearly not solved right now.

And it's going to take at least a decade, probably possibly much longer to solve it.

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And also in the short term, if we start building these robots, guess who's going to build them. We don't have robots to build the robots.

And so there's going to be a big boom in jobs for robot manufacturers.

And so that'll give us a burst of extra jobs for the next 10 or 20 years.

And so, yeah, so that's one thing is just even in the optimistic case, there's going to be a shortage of robots and jobs building robots for the next decade or two at least.

Yeah. And you talking about the plumber kind of coming over kind of leads you into like the next example you gave was just like human interaction being a luxury.

So there's actually two questions that come from it.

So can the robot plumber not crush your pipes with its super mega grip?

Do you actually even want a robot in your house doing something versus having an actual plumber who you can ask questions to like this, this or that?

Talk about the like human interaction aspect of this.

Yeah, absolutely. So I think a plumber I think is not a super clear cut case.

You could imagine if the plumber, the robot plumber was good enough and had a sophisticated conversation.

I like it's conceivable that people would want that if it could get the job done.

But yeah, the clearest example I think is childcare.

Like even if you could make a robot that was provably completely safe and had a little tutor module so it could like teach your children things.

I think most people still would rather have a human being raise their kid than a tutor because like children I think are hardwired to want to interact with other people and would just be kind of freaked out by having like a robot.

So that I think and I think there are a lot of other things in the economy like that.

So you think about like, like for example, workout apps, I have gotten pretty sophisticated.

You can get a perfectly good workout, you know, with just your smartphone, but a lot of people pay for in person workout experiences.

And part of that is I think a motivational thing like people like to impress other human beings.

And so you're going to be more motivated if like, you know, the teacher is going to be disappointed you if you're not working hard.

That helps.

And also it's just like fun to interact with other people.

Another example I use in the piece is coffee shops.

Like we have pretty good coffee makers, right?

There are like high-end coffee makers that can make a cup of coffee that's pretty much indistinguishable from what a human would make.

And yet lots of people go to a coffee shop where you pay a much higher price for a human-made cup of coffee.

And I think why they do that is a little bit complicated and varies from person to person, but on some level it's just a nice experience to go into a physical store and talk to a human being and have them make the, you know, make some small talk and have them make your coffee.

And give it to you.

Now, not everybody or even most people want to do that, but there's enough people that there's a

bunch of jobs for baristas.

And I think any kind of hospitality industry, all the care industries, those are all going to have that characteristic musicians, you know, you can get, you can listen to music for basically free these days in a recorded format.

But lots of people will pay a premium to go to a concert and hear their musicians.

So yeah, I think there's always going to be a lot of demand for entertainment, hospitality, care from a human being as opposed to a robot.

And the other thing that's interesting off of your point around concerts is that if anything, the ubiquity, the ubiquitous nature of like quote unquote free music actually makes the concert experience more valuable in of itself.

So I actually think that when I, you know, when everyone in their cousin got like, I mean, currys are not comparable to like a coffee shop coffee, but I think just mass ubiquitous, easy access, decent coffee just makes the actual like cafe coffee shop experience like stronger.

And then just the last one is just the growing.

Your point about how if the pie grows on ironically, you could see just actual employment benefit, the example being like thinking of like, can you explain how like the story of like the ATM's adoption, which it's obvious when you articulate it this way, but it's actually like not apparently obvious that the introduction of the ATM would increase the number of jobs in like the banking industry.

Yeah, absolutely. So I don't think it was increased, but it was pretty steady. So in the 80s and 90s.

So you're right. Cause like, so it's, it's not, it's just like not like mass elimination.

Yeah. Yeah.

I mean, you look at the chart kind of wiggles, but yeah, so in the 80s and 90s, banks and there's a ton of, a ton of ATMs that do the kind of basic money dispensing that we used to be the main thing tellers do.

And so you would have expected a pretty steady drop in the number of uptellers and that's not actually what happened.

And the reason is kind of two things. One is that banks realized that it was good to have some tellers on hand to kind of upsell, you know, you come to get your money, but they try to sell you a mortgage or, you know, some other product.

But then the second thing was because the ATMs made it cheaper to run a branch banks open more branches. And so there were fewer tellers per branch, but there were more branches and that kind of was a wash.

And so from roughly 1980 to 2010, the number of bank tellers was pretty constant. Now, I think it did relative to a baseline where it continued growing. It probably did shrink a little bit.

And I think probably in the long run, it will decline because you are seeing people gradual, especially younger people gradually shift to completely cashless payments, but it was a very, it's been a very slow and gradual process.

And if you were a bank teller in 1980, you would have had a nice long career ahead of you easily could have worked another 20 or 30 years without losing worry about losing your job.

Yeah, so then I guess in the last few bits here, you just kind of make the point that and it's sad to say this out loud, but it just seems to be demonstrably true.

I'm I'm just I'm 31. So I am just I'm about as young as you could be and still remember that pre Internet pre Internet world. Like I remember when we first got Windows 95 in my house and

everything.

So your point is if you actually just look at our lives over the past 3040 years, the actual physical world, despite the existence of the Internet is not that transformationally different.

In comparison to see like imagine a 19th century town before the light bulb just before the light bulb before the car think of all like the horse crap on the like, you know, the streets of a city this this or that.

So the physical world actually looks quite similar where we've seen so much of the impact is in culture. So like once again, you are listening to digital music instead of going to that record store, etc, etc, etc.

How do you see AI impacting culture?

I mean, it's really hard to predict right if you'd ask somebody in 1995, like what's the Internet going to do for culture. I don't think people would have predicted social media. I think they wouldn't have predicted how kind of YouTube would completely change video formats and how people consume media.

So it's it's hard to predict. But yeah, the idea that that like the physical world hasn't changed that much. I'm really like channeling Robert Gordon who has a he's an economist who had a book about about 10 years ago now making this argument from 1870 to 1970.

You had these really dramatic changes in life, not only the obvious things like, you know, cars and telephones and televisions, but also things like inter plumbing and antibiotics that really reduced child mortality and in some ways I think there just wasn't.

In some ways there just wasn't that many things to improve after that like the kind of modern life like the really big problems people had like their children dying young and not having a foodie like those are solved.

And so it's hard to have for new innovations to have as big of an impact as the old ones. Yeah, so but I think in terms of the, the, the impact of the Internet culture of AI and culture, I think you're going to see just the fact that software can generate content autonomously is going to be a big deal and I think it's hard.

It's hard. Yeah, it's hard to predict like what, like, what types of culture consumers will like because I think people do like to have connection to the artists that they're, you know, the musicians or the actors or whatever so you could certainly have completely

synthetically generated like TV shows where, you know, the people are all imaginary and the computer like wrote the script I think people probably won't like that I think they'll probably like to know or at least believe that the people they're interacting with are real.

But the line between like reality and and like fake content will be much blurrier. And I think people will come up with new types of entertainment where like I mean certainly science fiction you'll be able to have it would be much easier to come up with like crazy science fiction scenarios and depict like

worlds that are very different from our own. And hopefully it could be very empowering because you could have like individuals that can make works that are as creative or as interesting as what used to take, you know, a big team in Hollywood or, you know, a big team of like sound producers or whatever so it could

certainly be having more of a democratizing influence. But yeah, it's just really hard to predict like exactly what a thing like it's gonna be really, I think it's just gonna be fun to see what people come

up with.

So to really sum up, this is less about predicting that employment or the economy will be x, y and z in 2035 and more, we should think of the potential for economic change as just similar to how software interacted with the world which was it really impacted categories where software or created exponential step changes in categories where where once again software your software and it had limited or reduced impact in areas where software met real world constraints and that dynamic is probably how you see the AI dynamic approaching.

So I think the last real question here would just be, we spent a lot of time kind of like poo pooing not poo pooing in bad faith but just sort of saying, here are ways that Silicon Valley had blind spots when it came to the software space.

Coming from kind of like the DC perspective side of things. What do you see as the blind spot that just like the quote unquote like traditional legacy East Coast world would have towards software and AI as we're having this conversation today.

I think honestly a lot of us just that I think people here just don't know what to think, like I don't think there's a lot of like wrong ideas necessarily I think it's like, well I think six months to a year ago people just weren't paying attention at all there was like no.

Nobody really had AI policy ideas because it just wasn't something that was on anybody's radio radar. And now I think people are scrambling to catch up but I think one of the big problems actually is that there is a community of like AI safety experts in Silicon Valley.

But I think those people have so little DC experience that the the way they're talking about it is not very helpful to policymakers here.

You mean like AI is going to kill us all discussion with this.

A lot of that yeah I mean both like that conclusion but also just like, I think that policymakers are usually very pragmatic, and they're say okay like maybe you're right that it is going to destroy the world like then what should we do about it.

And it's kind of not clear what the answer is. And yeah and so it's just, I think you see a lot of those two communities like talking past each other, and something I'm hoping to do is kind of be concrete. So like what one other piece I wrote for my newsletter was about voice cloning, which is, you know, you can upload some samples of your voice and then it'll create a virtual you that can you can then type words and it'll read those in a voice that sounds indistinguishable for you.

This has lots of obvious negative applications in terms of fraud and and things like that and yeah. Say goodbye to confirming your bank account information by just saying your social security number over the phone.

Yes, exactly. And so like that that's going to create a lot of problems. I'm not sure there's like anything immediately that that policy makes me to do but I think it would be helpful for both Silicon Valley and DC people thinking about these kind of policy classes to be like trying to think concretely about those kind of issues, both because I think they're going to become important sooner, but also because I think flexing that muscles and building those connections where, you know, people are talking about those kind of concrete issues will hopefully build the infrastructure relationships that then if the killer robots come along or whatever will just all be in a better place to kind of understand how DC understand the AI world, help the world understand the policy process. And yeah, kind of a walk before you run kind of approach.

It's been really great Tim could you just we talked a lot about your your AI writing but obviously you

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write like full stock economics which is much broader can you just shout out your work and give listeners like an understanding of like your broad scope so if they could learn more.

Absolutely so yeah so I'm either science by training but I've been a journalist for about 10 years and in 2021 I started a newsletter called full stock economics and then a few months ago I pivoted and I'm mainly now doing the AI newsletter.

And but my work I think has always straddled the line between you know economics and business on the one side and policy on the other and I'm sorry and technology on the other.

And so my, my, my AI newsletter, I've tried to really focus on questions that have a policy component to them was my first piece I wrote was about the copyright implications of AI, and then the most voice learning piece and then I was writing about the labor market.

And so in the future I do want to also do some pieces just kind of explaining you know the the name it's understanding AI so I would like to explain some how some of the technology works.

But really I do think there's room to kind of talk to people that are being affected by the technology and yeah just kind of figure out like how you take the very abstract discussions about what the technology can do and figure out like how it affects real people's lives.

Excellent thank you for joining me on the realignment.

Thank you so much this was fun.

Hope you enjoyed this episode.

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