

**SDS PODCAST
EPISODE 735:
A.I. PRODUCT
MANAGEMENT,
WITH GOOGLE
DEEPMIND'S HEAD
OF PRODUCT,
MEHDI GHISSASSI**



- Jon Krohn: 00:00:00 This is episode number 735 with Mehdi Ghissassi, Director and Head of Product at Google DeepMind. Today's episode is brought to you by Gurobi, the Decision Intelligence leader. And by CloudWolf, the Cloud Skills platform.
- 00:00:18 Welcome to the SuperDataScience Podcast, the most listened-to podcast in the data science industry. Each week we bring you inspiring people and ideas to help you build a successful career in data science. I'm your host, Jon Krohn. Thanks for joining me today. And now let's make the complex, simple.
- 00:00:49 Welcome back to the SuperDataScience Podcast. Today's episode is a special one on designing AI products, with perhaps the best person in the world for discussing this topic. Mehdi Ghissassi has been head of product at Google DeepMind, the world's most prestigious AI research group, for over four years. He spent an additional three years at DeepMind before that as their head of AI product incubation, as well as four years before that in product roles at Google, meaning he has more than a decade of product leadership experience at Alphabet. He's a member of the Board of Advisors at CapitalG, Alphabet's renowned venture capital and private equity fund, and he holds five master's degrees, including computer science and engineering master's degrees from the École Polytechnique in Paris. He also holds a master's in international relations from Sciences Po, which is in Paris, and an MBA from Columbia Business School in New York.
- 00:01:40 Today's episode will be of interest to anyone who's keen to create incredible AI products. In this episode, Mehdi details Google DeepMind's bold mission to achieve artificial general intelligence. AGI. He talks about game-changing DeepMind AI products such as AlphaGo and AlphaFold. How he stays on top of the fast moving AI



innovations that are out there. The key ethical issues surrounding AI. AI's big social impact opportunities. His guidance for investing in AI startups and where the big opportunities lie for AI products in the coming years. All right, you ready for this sensational episode? Let's go.

00:02:22 Mehdi, welcome to the Super Data Science Podcast. It's awesome to have you here. Where are you calling in from today?

Mehdi Ghissassi: 00:02:27 Thanks, Jon. It's great to be here. I'm in Dubai.

Jon Krohn: 00:02:31 Nice. And so we know each other through Thomas Scialom. So I was actually, when I saw the kind of time that this was on my calendar early in the morning on New York time, I had this just assumption in my head that you'd be in Paris because of Thomas. So Thomas, in his episode number 713, amazing AI researcher. We talked a lot about Meta's Llama models, for example, which he played a leading role in. So Llama 2 in particular, which has made a big splash. And some insight into what could be coming with Llama 3, which is really cool. And so yeah, I don't know. I was kind of had in my mind that you'd be in Paris. How do you know him? How do you know him so well? It sounds like you guys are really close. Yeah.

Mehdi Ghissassi: 00:03:19 Yeah, we're very good friends with Thomas. We met through common friends actually, and we have many, many more. It's the, let's say it's the Paris French AI folks.

Jon Krohn: 00:03:32 Nice. Yeah, it sounds like a very special community there. And at the time of recording, I'm two weeks away from being in Paris, and so hopefully I'll get some exposure to some of these AI folks. We are trying to line up interviews with the co-founders of scikit-learn, of that open source library, which would be really cool interviews. So fingers crossed that that comes through.



- Mehdi Ghissassi: 00:03:55 Yes.
- Jon Krohn: 00:03:57 But yeah, amazing there. It seems like there's been a really strong AI education in French universities since the '80s at least.
- Mehdi Ghissassi: 00:04:05 Yeah, absolutely. The French system has this great focus on maths. And so from that then you have all the great engineering schools and ecosystem and people go study computer science. And so that's why a lot of the researchers in the field, many of them had studied in France. You can think about Luc Julia. And Yann LeCun who's now at NYU and Meta AI right, and many, many more in there.
- Jon Krohn: 00:04:35 Yeah, for sure. So Mehdi, you are at Google DeepMind and there you're a director and you're head of product. And DeepMind, Google DeepMind is, I think personally, there's lots of obviously amazing AI research labs, but if somebody forced me to pick, which is the number one, I would say DeepMind. So it's awesome to have you here, really in honor. And the bold mission of Google DeepMind is to fundamentally solve intelligence and use this technology to advance science and benefit humanity. So let's start there. Can you dive deeper into what it means to fundamentally solve intelligence? And how is DeepMind envisioning achieving this colossal goal?
- Mehdi Ghissassi: 00:05:24 Yeah, thanks a lot, Jon, for the kind words on that. And yeah, as you mentioned, the mission is to solve intelligence, to advance science, and benefit humanity. And DeepMind, Google DeepMind is the merger of DeepMind and the Google Brain Team. And DeepMind was founded in 2010 by Demis Hassabis, Shane Legg, and Mustafa Suleyman, and they used to refer to it as this Apollo Program for AI. The idea was if you were to put together the world's best scientists and engineers and other functions in the same place, give them all the

resources that you need, things like compute for example. And then see how much progress would happen in the AI field, where would we get to and what breakthroughs would we be able to achieve?

00:06:17 The other component of that is the fusion of two cultures. One is this academic culture where you have blue sky thinking and incredible scientific progress that happens in the world's best academic institutions. And the second is the startup environment. The pace, focus, and energy that you have in the world's best startups. And the idea that they had was if you're able to fuse these two things together, how far can you go? And so the objective is to build these general purpose learning algorithms. And what does that mean? So in the history of AI, AI is not a new word. It was coined in the '50s, 1956 I think, to be exact.

00:07:06 And you had a first phase of AI algorithms which are framed as good, old-fashioned AI. And there, what happens is that humans or developers will write lines of code to explain to the machine what it should do. So you can think of it as this long list of if/then statements in a program. So humans tell the machine what to do. And maybe the most known system of those is Deep Blue, right? Like how the IBM that beat Kasparov back then at chess. So you can tell the machine exactly what to do and you can map out all the options, and then you know that by brute force kind of you will solve it.

00:07:50 And then came the new learning systems where you give the machine data and then from first principles it figures out the rules. And through that, what we noticed is that machines are able to find new knowledge and help us learn new things. So we don't tell the machine what to do, right? It's able to figure out these new learnings and then share it with us. One of the examples of these algorithms is AlphaGo. So AlphaGo, the game of Go is this very

ancient game, more than 3000 years that's played a lot in China and Asia. And it's a quite simple game in terms of the rules. There are only two rules. But the possible combinations is I think 10 at the power 170. And so it's more than there are atoms in the universe. It's really, really hard to force brute a solution.

00:08:47 And AlphaGo was able to actually, playing with the world's best players at Go, to actually beat them. And in doing that, it showed new ways of playing. There are many, many moves, like Move 37 in Game Two, which had never been seen before in the history of humans playing this game. And that shows you the power of these algorithms that they can find new knowledge where humans weren't able to find before. And so that's the idea of it.

Jon Krohn: 00:09:19 You cited a very specific move there. You said Move 37 of Game Two. Can you explain a bit more context around what Game Two is?

Mehdi Ghissassi: 00:09:27 Yeah, so there were five games in this tournament between Lee Sedol, the world's best player of Go at the time, and AlphaGo. And so in these five games, AlphaGo won four times, Lee Sedol won once. And in the second game, there was this move that the machine made that surprised expert players who had never seen it and didn't understand why the machine did that move. And it's only 100 moves later in the game that people understood that that move actually is what enabled the machine to win the game. Because it had figured out 100 steps before, that that specific play would help it win the game. So yeah, it's a big, big moment, almost like a Sputnik moment if you want, in that game.

Jon Krohn: 00:10:21 And apologies that I'm interrupting you here, but for people who would like a fascinating, so a lot of our listeners obviously are going to be interested in AI and

machine learning. There's this documentary called AlphaGo, which is available in full on YouTube and Netflix. And the last time I looked it had 100% rating on Rotten Tomatoes. And you can see why, because it's exceptionally well shot. But the really cool thing about this is that if you, as the listener of this show, are very interested in AI yourself, but you have a friend or a loved one, a family member who maybe doesn't know much about AI but really likes spending time with you, you can watch this movie together because it's not like a technical deep dive. It's more like the human story. It's about the people who were developing the algorithm as well as the human players that it was playing against, like Lee Sedol that you're mentioning in this five game series, who at the time was the best Go player in the world. And so it's a very accessible and interesting and well shot, well cut documentary that you can watch with somebody who doesn't necessarily have a technical background. And both of you can really enjoy it. So anyway, I interrupted you.

Mehdi Ghissassi: 00:11:42 No, no, no. But thanks for doing that and mentioning it. As you said, it gives you the behind the scenes of what was behind all the work that happened there. And so yeah, definitely recommend watching it.

Jon Krohn: 00:11:55 And you were talking about, I interrupted you as you were describing Move 37. And how it's basically, I think maybe to try to get you back on the path that you were on. It's this idea of alien play is something that I've read about it being described. I don't really know Go. When somebody does, when DeepMind picks a move or human picks a move, it's all, I have no idea how to tell. But like you're saying, expert players see this Move 37 in Game Two and they're like, "What's it doing?" And you only discover 100 plays later, 100 moves later that this was actually brilliant, this kind of like alien play. I've read that it has changed the way Go is played. That the world's best

Go players have been studying the things that machines have been doing in the games. And so it's like having this, and it ties into this whole idea that started with my question of what is solving intelligence mean? And it's like having aliens come to us and be like, "Ah, you silly humans with your simple Go moves. Check out this move." And you learn from this other entity that previously didn't exist on the planet.

Mehdi Ghissassi: 00:13:07 Yeah. There is some of that. That as humans, we can deal with a certain level of complexity, but then we can also build technology. So we build it, it's not someone else who does it. And it helps us discover new things and expand the level of our knowledge. And through that we then learn the next steps of what we can do there. You mentioned how the game of Go changed after AlphaGo and players, soon players started to think about these new moves and new ways of playing. And you can see this generalizes beyond just games. The similar techniques that we use there, we reused in other product applications across Google, and we might talk about these later. And similar with the data center optimization work, with better video compression techniques, et cetera. A lot of what these systems enable you to do is to find new knowledge. And then if they can generalize, then you can take it to other areas and help solve other problems.

Jon Krohn: 00:14:25 Gurobi Optimization recently joined us to discuss how you can drive decision making, giving you the confidence to harness provably optimal decisions. Trusted by 80% of the world's leading enterprises, Gurobi's cutting-edge optimization solver, lightweight APIs and flexible deployment, simplify the data-to-decision journey. Gurobi offers a wealth of resources for data scientists. Webinars like a recent one on using Gurobi in Databricks. They provide hands-on training, notebook examples, and an extensive online course. Visit Gurobi.com/SDS for these resources and exclusive access to a competition

illustrating optimizations value with prizes for top performers. That's G-U-R-O-B-I.com/SDS.

00:15:10 Yeah, it is really cool how transferable it is. Yeah, I mean, so specifically another kind of huge achievement that, for me with my PhD was applying machine learning to medical sciences. And so I don't know, it's a space that's always fascinated me. And so the AlphaFold progress was wild to me. And so to really briefly, you could do a better job explaining this than me, but it would've taken prior to AlphaFold, it was typically like five years or more of PhD or postdoc research projects to obtain the structure of a single protein. And then now with AlphaFold, you can predict the structure of millions of proteins basically instantaneously. And so this isn't a minor change. And this isn't like in Go, it's like, "Okay, now the machines can be better than humans."

00:16:11 And in some ways it kind of feels to me like with the Go, it's relatively incremental. There's only so much better at Go I guess, that you can be. Whereas with something like this, with the protein folding, it's like there was this opportunity to be many orders of magnitude better and faster than humans, and AlphaFold achieved that. Yeah, so it's wild. So you can maybe provide our audience with a bit more context on AlphaFold. And yeah, just let us know how you think breakthroughs like this, like these huge orders of magnitude changes in these kinds of intellectual capabilities that we now have and what impact that will have on medicine?

Mehdi Ghissassi: 00:16:54 Yeah, absolutely, Jon. As you know, given you studied all these things, proteins are at the basic structure of life, you find them everywhere. And the protein shape, how these proteins fold, is incredibly important for a lot of downstream applications. And so there was this grand challenge of protein shape that was run every two years. The CASP Competition. And the AlphaFold is a system

that is, given the sequence of amino acids of a protein, is able to predict its shape. And the team worked on this for many, many years and entered this CASP Competition. And as you said, there was a step change in the ability of humans to predict protein shapes after the introduction of ML techniques in there. To the point that the organizers of that grand challenge decided that it was solved. This was a big scientific problem that was actually solved, and they've stopped running that because we now know and have all these shapes.

00:18:09 And to the point you made on, it took five years to a postdoc. Actually I was having lunch one day in London with a friend of mine and somebody sat next to us. And we started chatting and they said that they were doing a PhD in life sciences and that they were focusing on finding the structure of one protein. And when I had mentioned that where I worked, they said, "Oh, I'm not like you. I don't know what to do now because I was planning to spend the next five years doing this and in year one and now it's solved." So I told them, "Yeah, maybe you can spend time doing what you were planning to do after having found that shape." But yeah, it's an incredible achievement for humanity and for science and for the field of life sciences and biology. And it's made available, it's open-source research. I think most if not all of the researchers in the world around life sciences have actually used the database and are using it.

00:19:12 And it opens up, it's one of those root node problems that opens up many, many fields of research and applications. Things like drug discovery, different enzymes. Perhaps even in the sustainability and new material space. You can think of applications of this there. So it's quite exciting to be able to have these tools available to the world.



- Jon Krohn: 00:19:39 Nice. Yeah, it's very cool. And it's amazing how we still today, despite competition between some of the big AI labs, some of the big tech companies, that we still have this element of open source sharing and conferences and collaboration. Code, papers, data, results, so many of these things get shared and get made public. It's awesome to see. And it's an interesting, I don't know if people would've expected this. That things like the internet and how the internet in the '90s was like, "Oh, it's going to be this big, amazing, free thing that's going to make the world a better place." And in the end, it ends up being this system that causes really contentious politics and isn't as free as people thought it would be.
- 00:20:35 But then with AI research, it's actually kind of like, well, it's interesting if you thought about would people be just sharing these really valuable secrets, which could be proprietary information? It seems like that's something that you would predict people wouldn't share, and yet it is shared. And so yeah, it's cool that there's this. I guess it in part comes from so many people working in machine learning research, coming from academic backgrounds and wanting to maintain that culture. And realizing that as a whole, we're all going to move together and make bigger progress if we share.
- Mehdi Ghissassi: 00:21:14 Yeah, absolutely. I think you're totally right there.
- Jon Krohn: 00:21:17 So speaking of collaborating together and moving in a particular direction, with DeepMind's goal of fundamentally solving intelligence, what do you think? What are your opinions on artificial general intelligence? I know that this is a term that some people don't even like because it's such a ... We've had in recent episodes, we've had AGI experts on the show who would say they don't think there is a single thing that is AGI. You could have maybe 100s of different tests that would allow you to get this kind of general sense that a machine is as broadly

capable as a human on so many different kinds of intelligence. But yeah, I don't know if you have your own definition of AGI that you like. And yeah, how far off you think it is, and the kinds of transformative impacts you might expect it to have on us?

Mehdi Ghissassi: 00:22:13 Yeah, different people have different views on this, and many people have changed also their views on these questions. Some people think it goes from in a few years, others count in decades. Where reality is, I'm not sure. One of the interesting things with technology is that as a lot of people say, we tend to underestimate the impact in the long term and overestimate the impact in the short term. And so you shouldn't be surprised if new emerging capabilities arrive before we humans even thought they would be possible. And so yeah, all I can say is that I don't know what I don't know. And that my job is more to figure out what to do with these technologies when they exist and to sometimes share ideas about what might be needed and helpful. But yeah, it's definitely an exciting time for whoever is in the field of AI and interested in advancing these technologies forward. And perhaps we'll realize we've had it way earlier than we thought we'd have it. Or we'd have some other different thing that's as useful and powerful too along the way, right?

Jon Krohn: 00:23:32 Yeah. That's something that the AlphaFold example is a perfect example of how you can end up with something that actually is very different from human intelligence and better in some ways. So it's like with the Go for example, that's like, "Okay, Go, it's this relatively constrained intellectual task." I realize that there's a huge amount of possibility in there, but there's probably some kind of limit as to how good you can be at Go. And so it's like that same kind of that idea, that fuzzy word of incrementality that I was talking about earlier. Where it's like, "Okay, AlphaGo is better than humans at Go." And it is this incremental step better. But with something like

AlphaFold, you end up having an algorithm that is able to do something that it's not even feasible. You wouldn't even think about a human mind being able to look at an amino acid structure and predict the protein from that.

00:24:35 So you end up with these capabilities. And actually another really good example is something like the GPT-4 algorithm. When that came out in March, it was mind-blowing for me that it's able to assimilate information from so many different sources. It's able to answer questions in a way that blend expertise from different subject areas. And yes, you can have a human expert that is expert in more than one thing and come up with innovative ideas that blend those together. But these huge large language models are able to be expert at everything at once basically, and blend any combination of those that you request. And this isn't something that you would ever expect a human to do. You're never going to ask a human to read everything on the internet and be expert at everything. And so it's wild to me that there's even this idea of what does it even really matter to have a machine that could do all of the kinds of intellectual things that human can do? When the machine can already in some ways do things way beyond what we could ever imagine.

Mehdi Ghissassi: 00:25:46 I think you're touching on the point of generalizability of these things, which is critical to intelligence. Intelligence is being able to do many tasks or cognitive tasks at human level. That's one of the definitions. There are many, many out there, as you mentioned. And so the promise of these algorithms is that if we are able to generalize them to many, many, many tasks and many, many areas, then we can probably get help on some of the main problems and challenges that we're faced with. And so to your point, we're moving from these very specialized algorithms that are really good at one task, to algorithms that actually can generalize across many, many tasks.

And then learn from those and keep on improving and self-improving over time.

- Jon Krohn: 00:26:39 And that's been a big thing. That's been a big approach at Google DeepMind and predating even the acquisition of DeepMind by Google. Where it was this idea of starting with relatively narrow tasks. So building a computer or building a machine learning algorithm that is great at Go. And then saying, "Okay, can we build an algorithm that is great at Go and chess?" And I don't really know how to pronounce it, but this Japanese chess as well. So these three games. And then later you're like, "Okay, let's build one algorithm that can play those board games and also play Atari video games." While separately there was this research track that was just playing the Atari video games. And even that was where you start with just a small number of Atari video games and it's a large number. And so it's this convergence of one algorithm being able to do more and more things.
- 00:27:34 Yeah, I guess the trajectory of that with what you guys are doing at Google DeepMind, is to eventually have one algorithm that can do all of these things. That can be a large language model like GPT4, but can also beat you at Go, and can fold your proteins for you, and can drive you to work and do anything, do all of these different kinds of tasks. So yeah, very, very cool what you guys are up to over there. In the kind of more immediate term, where do you think there lie big opportunities for these increasingly generalized AI systems to be useful to an average person? So I mean, obviously you can't go into proprietary things. I'm not expecting that. But when you, specifically as a head of product at Google DeepMind, are thinking about bringing AI to people and making a big impact, where do you see there being a big impact in the coming years as possible?



- Mehdi Ghissassi: 00:28:37 Yeah, there are so many options because these technologies are horizontal, so you can apply them to many, many areas. And I'm particularly excited about what you can do in fields where humanity is faced with big challenges. So you can think of climate change, you can think of education, healthcare. All these areas where we need new and creative thinking and solutions to this. And then you also have the ability to help people in many, many ways with these technologies. As you can see now, putting them and instilling them in all of the Google Product Suite and giving you more help to do tasks that you usually do. So yeah, these are some of the areas that I'm particularly excited about to see these make their way into the hands of people.
- Jon Krohn: 00:29:37 Nice. Great answer. Yeah, I don't know if you have ... I mean, that was a great answer in terms of obviously there's a huge variety of applications very horizontally. But I don't know, if you happen to have a concrete example or two, or maybe that isn't possible.
- Mehdi Ghissassi: 00:29:58 I mean, the challenge with this is that there are so many that it's hard to be excited about one versus another. But you can think of redefining the way that we interact with computers. You think about search for example. I don't know about you, but usually when you type into the box, sometimes you use a language that only people who search use. In the sense that you add a bunch of words and then you get those 10 links and then you start triangulating. But maybe if you're able to interact with the machine in a more natural language and that it can understand better intent and help you with that. Or if it can help you based on those interests, help you discover your interests that are linked to that. Yeah, these are things that I can imagine would help you grow and learn and further develop. So yeah, that's maybe one. But equally, there are so many more in various areas of science that we could touch on.

- Jon Krohn: 00:31:02 Mathematics forms the core of data science and machine learning. And now with my Mathematical Foundations of Machine Learning Course, you can get a firm grasp of that math, particularly the essential linear algebra and calculus. You can get all the lectures for free on my YouTube channel, but if you don't mind paying a typically small amount for the Udemy version, you get everything from YouTube plus fully worked solutions to exercises and an official course completion certificate. As countless guests on the show have emphasized, to be the best data scientist you can be, you've got to know the underlying math. So check out the links to my Mathematical Foundations and Machine Learning Course in the show notes. Or at JonKrohn.com/Udemy. That's JonKrohn.com/U-D-E-M-Y.
- 00:31:46 Yeah, this kind of natural language input and output is a big change. And that obviously is only just starting to be realized in terms of all the possible application areas at Google, the Bard algorithm is obviously great for that. I've actually, in a previous episode of this show, I was comparing OpenAI's, their search, they recently added Bing search into OpenAI. And so I tried it and I was really disappointed. And I was like, "Oh, man, with how amazing the OpenAI API is at the natural language piece, it's too bad that these results that come back. The whole experience isn't that great." And I was like, "It must be because of Bing." And it was actually that. It's interesting, I had never used Bard before, but because I'd had this disappointing experience with the Bing search in ChatGPT, I was like, "Well, let's see if Bard can do it." And Bard could, it could do way better.
- 00:32:48 So that was for me, it's this interesting thing where, I don't know from a product rollout perspective. Obviously, yeah, they're partners with Microsoft, so they've got to use Bing search. But it's amazing to me to think if there had been some way that they could be using Google search

instead and you'd combined, it'd just be such better results. Anyway, you don't need to weigh in on that. These are just my opinions. But yeah, I think obviously Google is, it's obvious to say that you guys are the leader in search. And yeah, it's interesting how over decades of experience with trying to do web searches using Google, people have developed this kind of strange syntax that you're describing. You get used to these kinds of keywords.

00:33:33 And this is something that has had a big impact on the product design for my company, Nebula. So we allow for a search over the meaning of people. So you can type a query into our database, into our platform, and it allows you to bring back people that you might like to hire or people that might be ideal sales leads for you. And there's been some changes in the algorithm, but it's been several years that we've kind of had the core algorithm. And the way that it works to me is quite similar to a Google search. Where it's obvious to me if I'm looking for a data scientist, then I type data scientist, PyTorch, large language models. And if you provide that kind of input to the algorithm, it's very good at pulling back people with those kinds of profiles in the search.

00:34:30 But because of things like the ChatGPT interface, and because of things like Google Bard, when people hear that we have an AI tool, they come in and they type, "Find me a data scientist in New York." They don't type data scientist, PyTorch, large language models. And so originally when people started doing that, my first instinct was like, "Well, we've got to train them to do something different. We've got to train them to do something more like the Google style search." But it turns out that you can actually use large language models to bridge that gap.



- 00:35:10 So we now just have a model that takes in whatever kind of natural language people put in, and we map that to the kind of input that is great for our matching model to use. So now somebody can come into the platform and type, "Find me a data scientist in New York." And that gets mapped to, okay, we're going to need to have a hard filter around the City of New York. And let's just take a guess at what kind of a generic data scientist, the kinds of skills that they would have. Let's provide those skills to the matching model and have it go out and find people. So it's this fundamental shift in the way that we can be interacting with algorithms. I absolutely agree to you that there's a huge amount of potential there. And just as one quick little side story on this, is that a year ago when a product leader in our company said to me, "Why doesn't it just understand my natural language? Why when I type find me a data scientist in New York, why can't it just do that?"
- 00:36:01 And in the meeting I was like, "That isn't something that is very plausible." I was like, "Let's go to Google and see how that works." And so I went to Google and I was like, "Find me a great movie." And then it just looks up like movies with the word great in the name. And so that was a year ago, but now a year later, absolutely that kind of query, if you do it, it is going to get picked up. You have Bard integrated right there into the Google search. And it is going to bring back a list of great movies, as opposed to finding movies with great in the name. So there's a huge amount of opportunity there. Obviously I'm agreeing with you. And it's amazing how quickly things are moving and how suddenly, how so much easier, it's become easier to deal with machines in natural language that we grew up with. Anyway, that was a long rant. It's your episode. I'm talking too much.
- 00:36:59 So yeah, let's talk a bit about your product leadership career that led you into this amazing opportunity. So



you've been working at Google for over 10 years, it looks like. And so yeah, that's amazing. And earlier in your career you focused on emerging markets and product development for Africa. How has that experience shaped your perspective on AI's global potential? And also AI's global challenges?

Mehdi Ghissassi: 00:37:30 Yeah, indeed. It's been actually more than 11 years now. And I had the luck to pass by different groups and teams and then see different perspectives of products in early stage and areas of the world. Some of the learnings, you go back to always the same basics of it's starting with the users, understanding their needs, figuring out how to build those. And the Africa experience was incredibly interesting in the sense that a lot of the things that you take as granted elsewhere, actually either do not exist or you need to adapt to. So an example is just the types of network that you have, right? When we're thinking about what products to build for the continent, we landed with a number of ideas.

00:38:28 But then realized that we don't have, there're not the same connectivity levels, on the same ecosystem, et cetera. And so we went back to building that from scratch. And so yeah, the main learning there is just to not come up with too many assumptions already. And again, start from first principles, understand the basics. Talk to the users, talk to the ecosystem, gather all those insights, generate assumptions, test them, and go back and iterate. So I think it was really helpful to switch the mindset that during that experience, to then reuse that over time and not take a lot of things for granted.

Jon Krohn: 00:39:14 Nice. And so then having worked in all those different kinds of groups across Google and now at Google DeepMind, do you have advice for other product managers who are trying to stay on top of rapid changes in AI? There's probably no single place where they're more

rapid than around you. How do you, as you're not necessarily an AI expert. You are in a sense, I don't mean to, but you know what I mean. You're focused on the product, as opposed to the model development. And so how do you stay on top of, or what's the right level for you to be able to do your job as the product leader while staying on top of all these different AI developments?

Mehdi Ghissassi: 00:40:06 Yeah, you're right. You're right that it's one of the challenges of the role. And it's not getting easier because these days, progress is at breakneck speed and there is new knowledge popping up almost every day. And so the easiest is to be involved in an AI research team close to them, but not everybody can do that. So another way is to go to research conferences, to follow researchers and research labs online. And to try to also focus on what you need to do versus what you would be interested in looking at and learning. And so yeah, the main advice is to try to understand exactly what your scope is and what do you need to know for that scope? And then iterate on that. Be open-minded to new ideas, but don't spread yourself too thin that you want to understand everything, everywhere, all the time. And I think prioritizing ruthlessly here also helps.

Jon Krohn: 00:41:14 Nice. Yeah, great answer. And then, so another thing that's specific to you at Google DeepMind is this amazing research culture. What do you think it is about Google DeepMind's culture and approach that has set them apart historically? And seems set to continue to set you apart in the years to come? What are the kinds of things that maybe you do particularly as a product leader to facilitate that impact?

Mehdi Ghissassi: 00:41:45 A few things. One is the focus on the mission that has been there since the early days. Second is the culture that we touched upon earlier, of this academic excellence matched with the focus of a startup. And then third is the



fact that we're part of a broader organization, Alphabet and Google. And so we work really, really closely with the teams, the other teams. We know about the challenges that they face, we know about their needs. And we also sit very, very close to research teams, and they're able to be plugged into this innovation engine and research engine. And then we do the matching of what does research has that's interesting? What do the product teams need? And can we work together to make that happen? So I think those are this operating model that we developed and this culture that we have, are helping us transfer technology quite fast, while being thoughtful on its applications, and learn continuously from that process.

Jon Krohn: 00:43:00 Data science and machine learning jobs increasingly demand cloud skills. With over 30% of job postings, listing cloud skills as a requirement today, and that percentage set to continue growing. Thankfully, Kirill and Hadelin, who have taught machine learning to millions of students, have now launched CloudWolf to efficiently provide you with the essential cloud computing skills. With CloudWolf, commit just 30 minutes a day for 30 days, and you can obtain your official AWS certification badge. Secure your career's future, join now at CloudWolf.com/SDS for a whopping 30% membership discount. Again, that's CloudWolf.com/SDS to start your cloud journey today.

00:43:42 Awesome. So yeah, earlier in the episode we were talking about the highly publicized AlphaFold breakthrough, and this has led to a spinoff out of Google, called Isomorphic Labs. And so Isomorphic Labs was created in 2021 to leverage the AlphaFold technology for drug discovery. And that same year, another startup, Collaborations Pharmaceuticals used generative AI for drug discovery. So overlapping application areas. And this company, Collaborations, they realized that there was, in their model's utility function, all they had to do was change a

zero to a one in this one place in their code, and it allowed them to generate 40,000 lethal molecules, most of which were previously not known to mankind. And so this goes to show that these kinds of powerful algorithms in the wrong hands could potentially be quite dangerous. So yeah, I mean, I don't know if you have thoughts on what we can be doing to prevent this. I know DeepMind has always had a culture that was safety and ethics first, being very careful about what's released into the public. And so yeah, I don't know if you have any thoughts on this or around the ethical considerations of product development at Google DeepMind.

Mehdi Ghissassi: 00:45:17

Of course, and thanks for bringing this topic up, Jon. I wasn't aware of this specific use case, but AI's evolving capabilities and use cases create the potential for misapplication, misuse, possibly unintended and unforeseen consequences, which is why we place such an emphasis on building this technology responsibly. For example, in 2018, we established the AI principles which are grounded in beneficial use and avoidance of harm because we understand that it's really, really important. And we internally provide education and resources to researchers, to partner, and we partner with government and external organizations to develop these standards and best practices. And it's really important to work with communities and experts to make AI safe and useful. And so we constantly learn from our research, our experiences, our users, and the wider community, to integrate those into the way that we approach this field.

00:46:24

Regarding AlphaFold, there was a lot of scrutiny, and it's in a very specialized area. And so we worked with renowned experts, talked to many, many experts in the field, from biologists, bioethicists, biosecurity people. Partnered with the European Bioinformatics Institute to release the AlphaFold database, and they guided us on how you could do that very safely. So I totally agree with

the point you made. And it just reinforces the importance of being thoughtful and integrating ethics and responsible and thoughtful technical safety practices while we develop these technologies.

- Jon Krohn: 00:47:09 So yeah, clearly, as I said, even in my question, you guys are leaders in making sure that these models are released ethically. And it's great to have some specific examples there, like the AI principles being published and working with experts, domain experts in the area that you're publishing this new capability. And it's interesting how, right at the beginning of the episode you talked about how DeepMind's bold mission from the beginning was to be like the Apollo Program. And so there's this sense of urgency in that. The Apollo Program for getting to the moon, it was like all hands on deck in the Cold War at that time. Trying to get people to the moon, investing huge amounts of resources. It would be staggering amounts in today's terms. And maybe the kinds of ... Actually, maybe I'm kind of now answering your question here, but it's the kind of urgency that maybe we should have and be investing in climate change, for example.
- 00:48:12 Yeah. So what is the urgency? Or what is driving that urgency at Google DeepMind in terms of getting this generalized AI capability? And tying it to the preceding question, does that ever have issues with this... Having new capabilities come out, it seems like it potentially, it would contradict trying to be safe. So there's like, on the one hand, you're trying to push things as quickly as possible. But on the other hand, you're trying to make sure that you're moving quickly without causing great harm. So yeah, I don't know, I think you understand where I'm going with that question.
- Mehdi Ghissassi: 00:48:52 Yeah. It's important to clarify here. The Apollo Program idea was to bring together these experts and give them resources to make advances. There is no timeline for that.

But you're right that it's a tension and it's a creative tension. And so at Google, we want to be bold and responsible, and that's what we're trying to do and role model. The bold part is being brave and optimistic about the benefits. The amazing benefits that AI can bring to the world and help humanity with its biggest challenges. Whether it's disease, climate, sustainability, etc. AI has a huge part to play here.

00:49:40 And then the responsibility is to make sure that we do that as thoughtfully as possible with as much foresight as possible ahead of time. And so you try to anticipate what the issues might be if one is successful ahead of time, and not in hindsight. So the idea here is just like people thought social media will bring so many benefits to the world 15 years ago, now we realize that it actually led to a lot of misinformation, et cetera. And so you're trying to advance responsibly, but be bold at the same time, and you have to find the balance between these two.

00:50:22 But again, there is no breakneck timeline or given. It's more the approach has to balance between the two. And that's probably why we are sometimes not the first ones to release some things out there. And also why the conversation about open source is really important. Because as you mentioned earlier, research is used to being very open and talking at conferences and open sourcing models, et cetera. But at the same time, some bad actors would be able to then access that and use it for things that you wouldn't want to see these technologies used for.

Jon Krohn: 00:51:08 Yeah. So that actually, your answer there is interesting to me because I had definitely assumed that the Apollo Program thing also did involve this sense of urgency. And so it's nice that you're clarifying that isn't the case. That it's more about getting the best researchers together from all of the world and having this blend of academic blue

sky thinking with fast moving, applicable startup culture. Very cool. Speaking of the sustainability benefits potentially, you had talked about way earlier in the conversation, maybe kind of around the time that we were talking about the Apollo Program thing initially some time ago. You were talking about ways that AI, so when you make a breakthrough on AlphaGo, if somebody who doesn't know, might think narrowly, "Oh, well, what's the point? What's the big deal about this algorithm that can be better than us at Go?"

00:52:09 Is this just academic that it's okay, we've proved that we can create a machine that is more intelligent on the specific task. And at that time you said, "Well, no, I mean, the same kinds of principles." And this also ties into something that you said more recently around the horizontal-ness of these innovations. And so those breakthroughs in deep reinforcement learning for AlphaGo end up being helpful in Google's data centers to be more energy efficient, to allocate energy more efficiently. So I don't know if you want to talk about that example a bit more and maybe potentially build on that with other ways that AI could help address climate change or sustainability challenges.

Mehdi Ghissassi: 00:52:55 Yeah, for sure. So as you mentioned, so you have these breakthroughs that start in research. And then you try to figure out where else can you use them? Where can you transfer these learnings? And so you look at problems that have similar constraints or features. And so in the case of the data centers, we realize that data centers also have a huge level of complexity. So you can think of a machine that has many, many knobs. And to find the actual optimum for them, there are so many knobs that you have to turn. And over the years, mechanical engineers and data center experts have been building these things and relying sometimes on heuristics of best practices. And so given you can collect a lot of data and

that there is a clear optimization function, reward function, if you will there, we thought that, "Oh, this looks like an RL system, where we can learn the optimum level of it."

00:54:07 And so working with the data center teams at Google, we run a number of pilot and then realized that once you let the machine learning algorithm take control of the load balancing and various other functions, it actually found ways to decrease the energy consumption used for cooling by 40%, which corresponds to 15% decreasing the overall energy consumed by the data centers. This is, again, an example of new knowledge that humans didn't have, but that algorithms built by engineers, have uncovered. And you are also right that these AI techniques can help with both adaptation and mitigation of climate change. So you can think of enabling a low carbon electricity by better grid balancing. There is also a project called Greenlight, where you can help reduce transport activity, and this looks at optimizing the green light system.

00:55:15 You can also, similar to, you can think of data center as a industry facility or building, and so you could optimize the energy consumption of a building. You could optimize supply chains. In a different vein, you can use remote sensing of emissions to, for example, protect forests from illegal logging, things like that. And then you can also predict extreme weather events. So think of flood forecasting, wildfire predictions. These are all areas where teams have been doing work and are able to help communities affected by these natural catastrophes.

Jon Krohn: 00:55:55 Fantastic. That was a great list of ways that AI can be used to prevent climate change or to deal with sustainability issues. Really cool. Thank you for going through those. Yeah, cool to see these direct impacts of 15% reduction in cost, that's a big deal with the size of Google's data centers. That's a huge amount of cost

saving, and it's a huge amount of reducing impact on our climate, if that's actually ... Because it's interesting because actually with Google data centers, they're using renewable energy anyway. But taking the same kind of approach, like you're saying, applying it to grids where they aren't using renewable energy, that's going to lead to this considerable reduction in the amount of, say, carbon emissions that go into the atmosphere. So very cool.

00:56:47 In another application area, Google DeepMind has been on the forefront, in fact, DeepMind even before the Google acquisition, has been at the forefront of generative AI with systems like WAVENET since 2016, and that clones human speech. And then there's DVD-GAN from 2019, one of the first video synthesis models. And since then, these "deepfakes" of images, and now probably soon videos that are really compelling, this has become a concern. So yeah, I mean, I guess don't know if there's anything extra to add here. Because we touched on this already when we talked about the release of AlphaFold and issues there. So maybe there isn't that much more to add here. Is it kind of more of the same with these other kinds of applications? Where it's about being careful with releases, considering the AI principles that you published in 2018, and working with experts to ensure that these releases are as safe as possible?

Mehdi Ghissassi: 00:57:55 Yeah, absolutely. Actually, it's the same bigger issues that we touched on before and all the potential misapplication, misuse, unintended consequences of the use of these techniques. And with generative AI, you might have more of these. And so I think recently we released SynthID, which is a tool so that you can detect images that are generated by AI. And so yeah, as you said, it's the same topic that we touched on and the same approach.

Jon Krohn: 00:58:31 Nice. And so speaking of deepfakes specifically though, outside of your work at Google DeepMind, you also invest



in startups. One of those startups, Buster.AI is a deepfake detection platform. Yeah. You've got that startup that you've invested in. You've also invested in a weather prediction company. I don't know, is it Jua? Jua?

Mehdi Ghissassi: 00:58:59 Yes. Jua.AI.

Jon Krohn: 00:59:04 J-U-A.AI. So yeah. So this is not related to your Google DeepMind's work directly, although except for I guess your expertise in AI probably comes in helpful in evaluating these companies. So what kinds of characteristics do you look for when you're thinking about investing in an AI startup?

Mehdi Ghissassi: 00:59:21 Yeah, usually given this is very, very early stage, you start by the team. And you look at who they are, what their background is, what is their track record, why are they doing this? It's really important, try to understand their values, how they think about things. Then the second piece is you look at the idea that they have and try to understand it. See what are the assumptions that they're making, why they're well positioned to be the team to deliver it, how will others do in that space? Then the third is, again, given it's very early stage, there'll be lots of pivots and things that happen over the course of the five, 10 years in which they're planning to deliver this. And so you try to see how big that market is and how structured it is and what might happen there. And then last you try to think about why you? What is the value add that you have for this team? Because as much as you're picking them, they're also picking you, and so they need to have a reason to do that. So usually these are the four things that I try to think about before joining someone's adventure.

Jon Krohn: 01:00:36 Nice. And where do you meet these people? We were talking actually before starting recording, that one of the big things for me, since the pandemic, I've been working

from my home office. As opposed to having a physical office to go to, which for my main job as a data scientist, I've always, prior to the pandemic, I was always in an office. And since March 2020, I've been working from home. And so if you're watching the video version of this podcast, you're typically seeing me in my home office in New York, which it's a pretty nice setup, but it gets pretty annoying when you're in this all day long. And it also means in New York pre-pandemic, there used to be tons of meetups that I'd go to. It was kind of like after work frequently and sometimes even before work, you could go for a pizza and a beer at a meetup after work. There'd be some VC firm that's running a round table discussion. Breakfast before work, and you get to meet people. And so yeah, I used to be able to meet other people having startups. It would be conceivable that I could be making seed investments or finding the right people. How do you end up finding prospective startups that you consider investing in?

Mehdi Ghissassi: 01:02:03

Yeah. It's a really important thing because for all the investing piece, there is a part which is finding the deals. And then there is assessing them, and then there is closing, and then there is the support that you provide. So that first part is incredibly important because it decides the quality of teams that you see, et cetera. In my case, it's mostly been through friends and former colleagues and people in this field who will refer things to me. That's usually how it has happened. It's more I'll hear of colleagues who are building something or friends who are building something. Or sometimes VCs will send deals saying, "Oh, we're looking at this. What do you think?" Et cetera. That's the main thing. Now, to your point on meetups, et cetera, there are more and more coming back. And so I think we get to have both the ability to do video calls, which are quick, et cetera, and to go to meetups, events in person where you build a different type of a connection.

- Jon Krohn: 01:03:13 Nice. And I can imagine, so you talked about those processes there, so finding the prospect of startup, assessing them, closing the deal, and then supporting them. I can imagine on that final piece, there's a lot of early stage startups out there that are delighted to have somebody who has so much AI product expertise like you advising them and being an investor with them. Are there any kinds of particular pieces of advice related to your AI product management that you end up typically providing to founders? Or any kinds of pitfalls that you suggest they avoid?
- Mehdi Ghissassi: 01:03:47 Yeah, totally. I mean, I also learned quite a lot actually from these interactions because it's so early stage that no one has an answer or knows what to do. Many times, it depends on the team. Everyone has areas where they're incredibly deep and good, other areas where they're developing. And so especially in this applied AI space, many times the conversations turn around, oh, we have this incredible technology and that's it. But you try to make them think about, is it only about the technology? I think Steve Jobs used to say, "Don't fall in love with the technology," and so can only paraphrase what he said there.
- 01:04:34 And then so that's maybe the first and most important one. That it's not just because you have this hammer that you have solved all problems. Others think more about the structure of team and types of people they have to surround themselves with. And so there, I've helped with connections, intros, et cetera, to people. And then sometimes even when they're looking for their first institutional ticket, it's also about how to approach that and who to talk to and making intros there. So yeah, these are maybe the three main areas, helping people think about their product end to end, not just the technology aspect of it. And then think about what is the composition of the team they'll need? And then third, who

are the institutional investors or other angels that would be beneficial for them to surround themselves with.

- Jon Krohn: 01:05:29 Awesome. Yeah, that sounds like three key areas that you would be able to lend a lot of advice in. Yeah. So thinking about the product end-to-end, team composition, and institutional or angel investor introductions. And several of your investments, like Glyphic and Context.AI, they seem to place a significant emphasis on enhancing user experiences and interactions. So maybe this, again, isn't too surprising given your expertise as an AI product manager. But yeah, I mean, this seems like I'm giving you a serious softball here, but how critical is user experience in AI products?
- Mehdi Ghissassi: 01:06:14 Incredibly critical, right? So yeah, those teams are fantastic engineers and deep technical people, but they still realize how important that piece of product development is. And so it's incredibly critical, right? You can have an amazing technology. If you don't nail the user experience, the UI, et cetera, it'll probably not delight users. So you probably won't have many users. So as you said, it's a very softball, and it's super important. And people spend a lot of time, a lot of time there.
- Jon Krohn: 01:06:49 Yeah. It isn't just about how great your AI algorithm is. So I guess kind of tying back to the thing that I was describing, conversations a year ago with my matching model, where I'm like, "No, no, no, no, no, our users are the problem. They just need to learn how to use my AI tool properly and they'll be fine." I know how to use my AI tool and I get great results. Why don't they? Let's give them a video, let's give them training, and then they too can be great at the matching model. And I think that was the wrong perspective, I'm happy to admit. And the better thing is now facilitated by having intuitive user experience. In our case by using large language models to map the kinds of inputs that people naturally use, and

mapping those to the kinds of language inputs that are useful to my downstream matching model.

01:07:37 So, nice. So in addition to your investing, your early stage investing, angel investing yourself, you also do sit since March of this year, as a member of the board of advisors for Capital G, which is Google's growth equity funds. So that's the other, that's a much later stage. So for our listeners that aren't aware, you have seed stage investing, which I think primarily that's what you do in your private life. And then once that seed stage startup gets its product market fit, they need to start scaling. They go to venture capitalists, and then once they've had a certain amount of scale, you'll start going to growth equity.

01:08:23 So when you have these kind of stable cash flows, you can move from the venture capital investments to the private equity investments. And yeah, Capital G is Google's growth equity fund. So yeah, I mean obviously again, you can't go into proprietary things or trade secrets. But maybe there's kind of general statements that you have around how in recent years, these transformative AI innovations, which are always accelerating, particularly in this last year around large language models and generative AI, how has this transformative, this very fast moving pace of AI innovation, influenced investing generally?

Mehdi Ghissassi: 01:09:10 Yeah, totally. Capital G is exactly what you mentioned, and so it's great. I'm very grateful to be a part of that. I get to learn a lot of things and meet a lot of great people. To the specifics of your question, one of the things is that it's hard to know what you don't know. And that's something that happens a lot in this technology world where things move incredibly fast. So currently, and you're very familiar with this, but in machine learning, there is this explore, exploit. And currently it's a huge exploitation phase. The scaling laws are working

incredibly well, and so people are exploiting that and throwing more data, more compute at these large language models and getting better and better results. And so that's currently what is really happening.

01:10:04 Now if you fast-forward, there are probably other things that will come up and definitely things around planning, reinforcement learning, problem solving, reasoning, those kinds of capabilities will probably come in the next wave, to continue to augment the capabilities of the current systems. And so we're probably, in a few years, we'll probably be talking about completely different and new types of products and experiences with never seen before capabilities. And so as I said about that, I don't really know what I don't know. But I'm pretty sure there we'll see some of these things emerge quite soon.

Jon Krohn: 01:10:55 Yeah, no doubt. Nice. And yeah, just to kind of wrap up here with some kind of more personal questions about your career and how you've ended up where you are. One wild thing about you that turned up in our research, is that you don't just have one master's. You don't just have two masters. You have five master's degrees. Is that right? It looks like two in engineering, one in computer science, one in international relations and affairs, and then an MBA from Columbia University. Is that right?

Mehdi Ghissassi: 01:11:33 Yeah, so one of the great things about French education is that it's free. And so my engineering school gives you automatically a second engineering degree from another school that you go to. And then I went to at the same time, to a political science and international affairs university. Maybe because I had a few time. And then I went to the US for business school. And so yeah, that's why I have all these degrees, but it didn't cost that much in the end.



- Jon Krohn: 01:12:02 Very cool. Yeah. Well, it's obviously paying off. You have a huge breadth of intellectual capacity that you're deploying across AI product development and investing. It's very cool. And yeah, I don't know. You're from Morocco, and I don't know if you know this, you may know this, but so our researcher, Serg, he works in agriculture. And so we've actually through him, so he's a data scientist working at Syngenta, the agricultural company. And so we've had things like episode number 705 of the show was about, we had a bunch of Syngenta experts on talking about how AI is being used in farming.
- 01:12:44 And then Serg himself was in an episode a little while ago, episode number 539, in which he talked specifically about his perspective using data science and agriculture. And so he brought up for me, this isn't something I would've known, I don't know if you know this, but Morocco, where you're from, is a country that is making big strides in applying AI to agriculture, and also to aerospace. So yeah. Is this something that you're still tracking? Do you think that there's this developing AI community in Morocco that's pretty cool to follow?
- Mehdi Ghissassi: 01:13:16 Yeah, actually on the agriculture bit, Morocco has the largest reserves of phosphate in the world. And so we have the largest fertilizer company in the world, and they are incredibly active in research and development. They even own a university that they've built from scratch where they do. So I'm not surprised by these things. And in aerospace, I think it comes from efforts by the government recently to build up the aerospace industry. And there's also the automotive one that's growing a lot. So yeah, I do think there are so many things that various countries can benefit from with AI. You can think of education, you can think of healthcare, we discussed already. A lot of adaptation to climate. A lot of countries who probably suffer from the climate challenge. And then also for many, leapfrogging all the government services, et

cetera, having a better digital experience. So yeah, I'm not surprised that the country is doing well in agribusiness and agriculture. I'm sure there will be other areas that they can benefit from AI too.

- Jon Krohn: 01:14:32 Awesome, Mehdi. Well, given your incredible career, the amazing things that you've learned across all of your five master's degrees, and given the skills that you've learned at amazing places like Google DeepMind, do you have particular skills that you recommend to our audience members? Maybe they are people who aspire to be product managers on an AI product, or maybe they're data scientists or machine learning engineers that want to be more thoughtful about product considerations as they develop their models and applications. Do you have any particular advice on what kinds of skills are most useful in this kind of AI product manager role?
- Mehdi Ghissassi: 01:15:17 Yeah, totally. I think first is a deep technical grounding. I was lucky to study science and engineering and computer science. And so I think that is incredibly helpful to understand this field and be able to converse with people in this field. I think the second part is if you are looking into building products in that field, then everything around more strategy, business acumen, these types of areas are critical. And then I think last one is, and sometimes folks coming from technical degrees tend to undervalue how important these skills are, everything around soft skills. I think being able to work with others, to be a team player, to communicate, to listen. Actually, it's really important to listen to what others are saying too.
- 01:16:12 So yeah, I would say that the combination of these have a strong technical grounding. The ability to then complement that with business sense and then last, just be a team player, which means understanding others,

communicating effectively, those are probably the areas that I would advise people to look into.

- Jon Krohn: 01:16:35 Nice. Yeah, great advice. I used to ask frequently on the show, I don't as much in recently. I think it's because now with Serge doing such incredible research, I just have so many things to get into. But something that I used to regularly ask our guests when I first started becoming host of the SuperDataScience Podcast was, "What do you look for most in people that you hire?" And this communication was the number one thing. On these technical hires, I'm asking about when you're hiring a data scientist or a software engineer, what are you looking for? And communication was key. So yeah, so I totally understand that. Listening, being a team player, business acumen strategy. But also as you mentioned at the beginning of your answer, the technical depth is definitely handy.
- 01:17:18 And so that's nice. Probably for our listeners, many of them have that strong technical background already, so if they're thinking about getting into more of a product role from data science, it's great that that technical depth will transfer and be helpful. All right, Mehdi, I really appreciate you taking all of this time out of the amazing things that you do at Google DeepMind in order to be able to enlighten us on this show. Really appreciate it. Before I let you go, do you have a book recommendation for us?
- Mehdi Ghissassi: 01:17:47 Yeah, of course. It's The Code Breaker by Walter Isaacson. So it's the story of Jennifer Doudna and all the others that were involved in CRISPR, and I think it's a fascinating look into science and all the miracles that it enables. So yeah, I read it and loved it.
- Jon Krohn: 01:18:06 Nice. That's a great recommendation. Yeah, Walter Isaacson, you just hear him time and again, creating these iconic books. And actually, I'm embarrassed to say

that I haven't read a Walter Isaacson book myself yet, but it sounds like I'm missing out, and that's one in particular that I should be checking out. Yeah, because obviously it's unrelated mostly to AI, but CRISPR is another place where in recent years, just unbelievable capabilities have been unlocked in medical sciences as a result. So yeah, very cool recommendation there. For people that want to follow your thoughts after this episode, Mehdi, how do you recommend they do that?

Mehdi Ghissassi: 01:18:45 Yeah, they can follow me maybe on LinkedIn or Twitter. It's easy to find. My handle is M and then my last name. I'm not super active.

Jon Krohn: 01:18:55 Yeah, we'll be sure to include links to your LinkedIn and Twitter accounts in the show notes. Thank you so much, Mehdi again, for taking the time. It's been awesome. This probably even comes across in the audio version, but particularly I can tell being on here with video with you, it's our YouTube viewers, you have this real warmth that emanates from you. And it makes it very easy to want to keep talking to you. And really enjoyable to listen to all of your thoughtful answers today on the show. So yeah, so thanks again for coming on and maybe we'll catch up with you again in a few years or something.

Mehdi Ghissassi: 01:19:32 Yeah, right back at you, Jon. The warmth is mutual. And so thanks a ton for having me. Thanks, Thomas. I don't say no to Thomas's advice and invite. And then yeah, I hope you have a great time visiting Europe.

Jon Krohn: 01:19:48 Yeah, thank you very much, Mehdi. All right.

Mehdi Ghissassi: 01:19:51 Thanks.

Jon Krohn: 01:19:58 Such a smooth, insightful, and widely experienced guest. Really enjoyed having Mehdi on the show today. In today's episode, Mehdi filled us in on how Google



DeepMind's bold mission is like an Apollo Program for AI that blends blue sky academic thinking with the drive of a fast moving startup. He talked about how attending research conferences and following key AI leaders on social media are his key ways to stay on top of the fast moving innovations in our field. He talked about how it's essential to work with AI safety experts before the release of any major AI project. How user experience is critical to the success of early stage AI products and startups. And how the big AI application opportunities in the coming years lie in natural language input and output, such as generative AI systems.

01:20:39 As always, you can get all the show notes including the transcript for this episode, the video recording, any materials mentioned on the show, the URLs for Mehdi's social media profiles, as well as my own at SuperDataScience.com/735. Thanks to my colleagues at Nebula for supporting me while I create content like this Super Data Science episode for you. And thanks of course to Ivana, Mario, Natalie, Serg, Sylvia, Zara, and Kirill on the SuperDataScience team for producing another sensational episode for us today.

01:21:05 For enabling that super team to create this free podcast for you, we are deeply grateful to our sponsors. You can support this show by checking out our sponsor's links, which are in the show notes. And if you yourself are interested in sponsoring an episode, you can get the details on how by making your way to JonKrohn.com/podcast. Otherwise, please share, review, subscribe and all that good stuff. But most importantly, just keep on tuning in. I'm so grateful to have you listening and I hope I can continue to make episodes you love for years and years to come. Until next time, keep on rocking it out there and I'm looking forward to enjoying another round of Super Data Science Podcast with you very soon.