

WE ARE ETH – Episode 21

With Rasmus Rothe, AI Expert and Co-Founder and CTO of Merantix

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[00:00:00] **Rasmus Rothe:** AI is not good or bad. It's AI in a certain application. Like the same AI could be used for cancer detection as it could be used for active military operations.

Susan Kish: In this episode, I'm talking with Rasmus Rothe, who joins us from Berlin. Rasmus studied engineering and computer science at Oxford, Princeton, and the ETH Zurich, and is the co-founder and CTO of Merantix, a company that builds and scales AI ventures. This is the We are ETH podcast, and I'm Susan Kish, your host.

[00:00:32] **Susan Kish:** Rasmus, how did you get started in the field of computer science? Were you interested in computers growing up?

[00:00:38] **Rasmus Rothe:** Yeah, I think I've been always interested in computers, I guess since I was like an early child. So first playing computer games and then when I was like 12, 13 I started programming, so I wrote my first like software. Laid up with robots when I was 16, 17, that played soccer. So I think even before going to university, I was very intrigued by writing software and building smart systems and then that kind of just directed through...

[00:00:59] **Susan Kish:** Wait. Before you get too far, there was a little phrase there. You built robots that played soccer?

[00:01:05] **Rasmus Rothe:** Yes, exactly. I was...

[00:01:06] **Susan Kish:** How does that work?

[00:01:08] **Rasmus Rothe:** I was participating in the Robo Cup. A worldwide robotics competition where basically robots play each other. So that's how it's currently, but the goal is basically that in 2050 the best robot team will be able to beat the Allstar human soccer team.

And so that's the kind of goal everybody's working towards. So there's basically a lot of universities competing, but also high school students back then. And the World Cup was actually in my hometown and so we were forced to participate, but really bad actually. And then I was like very motivated to do better next year and so did it again, became world champion actually back then.

I guess it worked out and yeah, through that, yeah, I got really excited about robots and the interplay of like hardware and software there.

[00:01:49] **Susan Kish:** And how did you pick where you wanted to study? Because it doesn't, it sounds like you decided I'm gonna go to a bunch of continents and go to the best computer science places around the world, but that sounds simplistic. So how did you pick Oxford? Princeton and ETH?

[00:02:05] **Rasmus Rothe:** Yeah. I think it was all like very sequential, so I don't think it was like part of a big master plan. At one of these science competitions, I just had met somebody who studied at Oxford, and I was at a normal German high school. It was not like the obvious move, but I thought, okay, if he can go there, why should I not also be able to go there? So I just applied, practiced, and then went there. And then from there basically there was an opportunity to spend a year in the US and to basically go a year to Princeton. And I really liked that. The kind of entrepreneurship side there was really interesting.

And then, after that I was really excited to do a PhD and kind of dive even deeper into AI and computer vision. And then looked around. I was fed up with the UK. I was fed up with the US and so then I looked at Germany and Switzerland and then basically, obviously ETH being one of the renowned institutions, looked there deeper and found basically my then supervisor, Luc Van Gool, who was not only very renowned in computer vision, but also had started quite a few companies before.

And so I really liked that combination. And when I visited Zurich, I had a great time and applied, got in and then got started. So that's the journey. So in retrospect, I guess you could fit a very nice story, coherent story through it, but I think it was very like step by step.

[00:03:09] **Susan Kish:** So, serendipity played a role.

[00:03:11] **Rasmus Rothe:** Exactly.

[00:03:12] **Susan Kish:** Why did you focus on computer vision? What was it about that you found interesting?

[00:03:17] **Rasmus Rothe:** Yeah, I think I was generally interested in AI, in building smart systems, and I realized that computer vision was very interesting because it's much easier to understand because it's about images, about videos, right? It's like stuff we can look at. It's not some abstract data and some database.

So I like that part that it's very - so more human and also that it has a lot of applications. If you think about what we humans do: we look at the world, we take decisions whether we drive a car or whether a doctor looks at medical images or whether we look in the environment or whether we look at the screen.

So it's just a very common interface for humans for the world. And so similarly would be very exciting to put some of that into a machine. That was one part. And the other part was in 2012 when I decided to do a PhD I saw first bits of computer visions to work really well and on real world applications.

And so I felt like it's a good time to get into the field and drive the applications even further.

[00:04:12] **Susan Kish:** Got it. So it had nothing to do with building the best robots to win the World Cup.

[00:04:17] **Rasmus Rothe:** No, I think there was less soccer then.

[00:04:19] **Susan Kish:** Yeah. I think I was, yeah. Somehow I never get got back to that space. I maybe at some point I should go back there and build robots again. Probably they're much better now. I haven't actually looked at the latest results there, but I think, in 2007 they were still relatively basic in their movements, so Yeah. I'm sure they're much, much better now.

Plus they're matching them up with Chat GPT, so they're getting pretty...

[00:04:41] **Rasmus Rothe:** can also talk now. Yeah. With Chat GPT.

[00:04:45] **Susan Kish:** They can talk. So the other theme that sounds through this is on about being an entrepreneur. When did you first have exposure to that? Was that, you mentioned Princeton, but was it really the time you spent to the US?

[00:05:00] **Rasmus Rothe:** I think as a, even in like high school I liked running these projects on the side. I think at that time it was science competitions or building these robots. Then, at Oxford and Princeton I run the entrepreneurship clubs. So that was a light touch to the entrepreneurship world despite like very far from real entrepreneurship.

But, and then in the US I spent some time at Google during an internship and I think there realized, you know, how interesting the tech industry is, but also that I probably don't want to join one of these big tech companies cuz it feels like a big corporate. And so I felt okay, maybe I do a PhD first, try to understand the field better and then I figure it out, and I think then really at ETH honestly, I realized, okay AI is one thing I want to do, but the second thing I really like is also doing a startup.

And I think for that the lab at ETH was really, yeah, central because when you have these startups like co-located at the lab and other PhD students starting companies

right out of their PhDs, that kind of inspires you and motivates you to also then start your own company. And so I think that made the, pulled the trigger for me.

[00:06:04] **Susan Kish:** Which lab was this?

[00:06:05] **Rasmus Rothe:** The Computer Vision Lab at ETH with Luc Van Gool.

[00:06:10] **Susan Kish:** Very cool. So tell us about Merantix. How did you come to start it? How did you meet your co-founder? What was the idea behind this?

[00:06:20] **Rasmus Rothe:** Yeah. Back then basically I realized the potential of AI, but also saw that there's still quite some gap between kind of what's possible from a research perspective and what are all these renewable applications, and I realized, okay, if you do maybe some venture building in this space, so basically incubate many companies that could create quite a big impact.

And then met my co-founder Adrian, who had built a dozen companies before up to a hundred million in revenue. So quite large companies also. And so he was also very intrigued by the idea. And then we got together and moved to Berlin and started what is now Merantix. And so with Merantix, basically we, we're ultimately an investment company in AI.

But what we do is first and foremost invest in AI companies by actually incubating them. So we have founders who come to us with their ideas. Sometimes we also have ideas and then look for founders for that specific idea, and then we develop it, try to find first customers, and then we turn that into a company and then also give them capital to basically build the first product and go to market.

And moving forward, now we've built around 10 companies in various industries from AI in healthcare to support radiologists over biotech optimizing proteins over FinTech automating some reporting through computer vision and factories. Now we just started a company in the fertility space, so pretty different industries.

And that's our bread and butter business. And then we've also done a bit of other things on the side. So we also launched the AI compass in Berlin, which is a physical space for around 600 people and 90 companies. That basic by now is like the largest cool working, co-location hub, basically that allows other companies also to be co-located and benefit from the ecosystem there. And that obviously also benefits our own companies.

[00:07:59] **Susan Kish:** So AI is the topic du jour these days, right? Whether you call it AI, whether you call it Chat, GPT, I guess it's Chat GPT four that's floating around now. Or rather you call it generative AI, whatever sort of term. Talk about the tipping point, cuz it really feels like the launch of GPT three just made it explode in terms of the public interest around it.

[00:08:22] **Rasmus Rothe:** Yeah, I think it was like, I think from a technological point, I think it was quite incremental. GPT three even was around already for quite some time before the chat GPT hype. And you could already tell in the last two, three years that the language model got better and better over time.

I think what has really changed it or what's was the tipping point was Chat GPT itself. That basically provided a very easy interface for anyone to interact with such an AI model. So before that, yes, you could maybe download some AI models or you could, query them through some API, but it was still something that was like mostly for people who know, knew at least a bit of programming.

But with Chat GPT there was like now is very simple interface where any person could ask questions or give a task for Chat GPT to complete. And I think that made it really accessible for anyone and so made also everyone realize that this is here to stay and will basically fundamentally transform all industries, all use cases, because if you think about what we humans do, we spend so much time on like reading and writing, text summarizing that, making decisions based on text, trying to get information together. And if suddenly, like there's an AI system that can do the same stuff in a few milliseconds and potentially much better, that will transform every single industry.

And I think that's what people realize now. And so that's why there's so much hype now.

[00:09:43] **Susan Kish:** So, you're saying it's two words and language, what that basic calculator was to numbers in some obscure way.

[00:09:51] **Rasmus Rothe:** Yeah, I think it's a bit like, the calculator, you could say for numbers, or you could say maybe even the computer more broadly. The personal computer that everybody would have access to a personal computer. And it was not just these like high performance clusters, like in the sixties, seventies, there were already some computers.

But it was only accessible for a very small subset of people. And then in the eighties and nineties that got democratized and suddenly, in the late nineties, many families had computers and that commoditization led to the transformation. It was not what happened in the sixties or in the fifties when there was already some early versions of computers.

And so I think it's something similar with AI right now, where now as it gets democratized, everybody can use it. It will just really transform. All the big use cases, but also all the small use cases. It could be a use case like, transforming healthcare diagnostics and completely doing the better or developing new drugs using AI and the pharma space.

But it could also be just getting some help to write the next birthday card, right? So I think that's the exciting part, that it touches all parts of life.

[00:10:57] **Susan Kish:** What do you see as the biggest challenges around successful application of generative AI over the next few years?

[00:11:05] **Rasmus Rothe:** So, I think in the short term, we need to make sure we don't over-regulate it right now. I think the EU right now is trying to regulate AI overall rather than the specific use cases, which I think makes much more sense because AI is not good or bad. It's AI in a certain application. Like the same AI could be used for cancer detection as it could be used for active military operations. We should much more focus on regulating the use cases than the technology itself. And I think that's something that the EU at least is trying to do wrongly at the moment, which I think will hinder a lot of AI regulations.

So that's like AI development. I think that's the problem in the short term. In the long term, I think there are serious concerns and they they're also valid that it will fundamentally change a lot of jobs. And through that also the whole labor market people need to be trained differently.

It would change that education system. We see that already now, right? That kids, use Chat GPT to do the homework. So, I think there's a lot of bigger transformational challenges in society, and I think they're super important to be addressed. I don't think we need to be there in a rush. Like it's not like we will, or we need to solve these problems in the next one or two weeks.

But we should certainly address them in the next couple of years. So, I think less regulation, the short term, but more focus on the long term and transformational effect.

[00:12:16] **Susan Kish:** What do you think about some of the ethical issues that come up around AI?

[00:12:21] **Rasmus Rothe:** I think we need to step back and we have this discussion because usually, like one of the big discussions is around bias, right? That AI algorithms are biased. And through that, basically maybe not as fair, maybe certain demographics have a disadvantage. But I think. The point is that problem is not new, right? So depending on how I get dressed or what ethnicity I have, if I walk into a bank and try to get a loan, I will also probably get a different type of offer. So these biases are deeply ingrained in our society, and aren't big problem and something we need to address.

And that's not a new problem of AI. And also some biases in the data sets. And so I think the advantage we have now with AI or more data driven systems is actually very positive that we can finally look at the data transparently, look what biases we have, and then also say, look like certain features we don't look at, we don't look at the postcode somebody's coming from, because that infers like what demography the person might be from.

And so that's why, when you give a loan, you should not be able to look at the postcode. That's the rules we can put in place when we have an automated decision-

making framework. Whereas when a human makes a decision, the human is a complete black box. I can't look into the brain of a person making a decision.

And I think a lot of these, problems that have been around for many years are now just being made transparent and people complain about it, but I think, and that's very good, but it's not a problem of the AI, it's a problem of broader society. Now we can finally address them. So I actually see it very positive the development there.

And I think it will take some time until we've established rules of what the algorithms can use and what applications. But I think it will change for the better.

[00:13:54] **Susan Kish:** So in other words, that concept of unconscious bias, but making it more transparent and more clear, you can start the process of taking out that unconscious bias that affects all of us, right? It's sort of part of the human condition, pattern recognition, et cetera. So one of the real interesting questions is how AI impacts education, right?

So if you're the president of the ETH and you're responsible for educating students, Basic research, applied research. Where do you see AI, generative AI, whatever this next generation of applications is gonna be? How's it gonna affect what your institution does?

[00:14:40] **Rasmus Rothe:** So first of all, I think it affects like all verticals in all industries. And I think that's why it's also very smart to have this ETH AI center that is, that Alexander Ilic is building and this team where you have, this AI center, but then it's somewhat integrated in all like domains and has collaboration with all professors because, AI is not, shouldn't be its own discipline.

Like it can be the very advanced, methodological research, but 90% of it is actually in specific applications. And in these specific applications, it makes sense to have a collaboration between an AI expert and somebody from biology, physics, chemistry, geology and so on. And so I think building these collaborations is super important and there should not be probably a single lab that is not using AI somewhere.

And building that setup I think is super important. Firstly, secondly we need to also I think, rethink how edu education happens overall. You talked about the calculator earlier, right? Like a hundred years ago. You would also learn calculus, but like without a calculator because, we do everything by hand.

Now, at some point the calculator came and there was also a big debate about should it be used in if they education system? And some people said yes, some said no.

[00:15:44] **Susan Kish:** When you think about using chat GPT, yes, people should learn handwriting. Yes, people should learn writing essay. Once you've written a few essays, you could probably switch to Chat GPT and then rather learn how to prompt

the Chat GPT to write text, or ultimately adopt the text Chat GPT generates. Because that's the reality, like that's how we write text.

[00:16:04] **Rasmus Rothe:** Nobody in five years will write like long text. It's like completely waste of time. What we will do is we will interact with an AI model. That will somehow help us to create the text, adapt it and we need to be good at that. And if we as a society wanna be competitive internationally, like we need to use those tools, otherwise we'll just need much longer and right.

Much worse text. And so I think the education systems needs also to have this foresight and think, okay. What kind of skillsets do people need to have in five or 10 years? So I think the very European mindset of just like forbidding Chat GPT in schools, I think is very shortsighted. It will not solve the problem.

[00:16:44] **Susan Kish:** Can Chat GPT, do problem sets. Does this affect engineering and mathematics and calculus and all those things?

[00:16:50] **Rasmus Rothe:** Yeah, it will.

[00:16:51] **Susan Kish:** And it can write programs as well, right? Programming, so it's not just the written word that's gonna change, it's gonna change how you do all those things.

[00:17:01] **Rasmus Rothe:** Yep. And you had al like even I had that at university, that there was some open book and some closed book exams. So there were also some open book exams where you could either use a book or I had even some in the US where I could use the internet and basically use any tools that are out there.

So I think basically at the beginning of the education system, things should be very constrained. So people learn the basics, but ultimately now there's exams also now where you can use Google, so the next generation will be okay you cannot just use Google, but you can also use like a Chat GPT, and it can help you solve your problem.

And so then it's just about reframing the problem into something Chat GPT understands or abstracting it a way, which is a quite high level task, right? Cuz you get some problem and you somehow maybe need to rephrase the bits restructured so that the LLM understands what the problem is you're trying to solve.

And that's a high level of thinking then we have to do or programming, right? Yes, Chat GPT can write your coat writes you a thousand out of coats, but there might be bucks in there. It might not do exactly what you want to do, so you still need to understand it. So I think that's the kind of skills we will be good at.

So we'll become more like the teacher than the students. So it's more like we give the problem to the AI, the AI solves it, and then we need to check the solution of the

AI and check if it's actually valid, a bit while the teacher does when grading homework. That's probably the skillset where things will converge towards.

And for some easier tasks, we might not even do that anymore, right? If the AI gets really good and we've had hundred problems where the AI gave the perfect solution, probably people stop checking the solution. And that's probably fine because in the real world you might not actually need to solve it yourself anymore in the future.

[00:18:35] **Susan Kish:** I saw a listing earlier this week for GPT Whisperer as a job which is probably just what you're describing, it's being able to understand how to phrase the question, give the parameters, work with it.

[00:18:48] **Rasmus Rothe:** And there's also saying that asking good questions is like actually really hard. You're doing a great job now cuz you have a good conversation, but it actually, like asking like five random questions is like easy. You don't need any preparation. But like asking the questions in the right way, in the right order, that requires quite some abstract thinking. And so I think that's the same kind of way we will interact with these AI models.

[00:19:11] **Susan Kish:** That's a great analogy for it. So how did your experience in your time at the ETH, during the PhD, prepare you for what you're doing now for running Merantix? Thinking about AI in the next series of challenges and opportunities.

[00:19:27] **Rasmus Rothe:** I liked that ETH was very international. And for a European school, very entrepreneurial. I would say there's still a big difference between the mindset also just like the scale at which people think, like in terms of size and ambition. The US is still a different beast, but I think for Europe it's very leading and I liked that the lab gave so much entrepreneurial freedom to develop your own ideas. I had also always some side projects running, I think that was very unique. And at the same time kind of pushing for academic excellence or trying to get into top tier journals and conferences.

So I had a great time. I was there for three years for the PhD. Met a lot of people still in contact with many still try to come back when I can. No, I am I'm very happy. And like, now in Berlin, there's also actually quite a few alumni. And so that's great.

Some of which also work now with Merantix. Yeah. It's cool to, to keep these relationships.

[00:20:15] **Susan Kish:** It's a small world. Very cool. While you were at ETH, if I read correctly, you started the largest hackathon in Europe.

[00:20:24] **Rasmus Rothe:** That was one of the side projects. Yeah. So I was I participated in a few in the US and then there was an idea from the entrepreneurship club to start one in Zurich as well. And cuz I was new in the city, I was like, okay, I can take care of it.

And then called up a few companies and we had an initial budget and basically I think 10 days after we started the conversation, we had five times the budget confirmed from corporates we wanted. So then we were like, okay, let's just make it like four or five times bigger if you have more money.

And so it turned out to be quite a large event already in the first year. And then, yeah, it grew even larger, turned into a company. And I think nowadays I don't know, 5,000 people applying, 6-700 people coming. Last year was the first year I wasn't there anymore. But the years before I was always there.

So, it was a good way to, to come back to ETH.

Which ones of your companies right now or your ideas at Merantix are you most excited about?

That's probably the first question I won't answer. It's like asking your fav, what is your favorite child? All of them. I think it depends. I think I'm. Look, I think there's some companies I'm very excited about the impact. So we have the Vara, the breast cancer screening company that basically helps radiologists to make less mistakes and work more efficient.

That runs already in a third of this cancer screening centers in Germany is now heavily expanding in more emerging markets like Egypt, like India. Doctors miss one in five cancers when they do breast cancer screening. Because they visually just don't recognize it cuz it's a hard cognitive task.

And of the ones they miss, we already find around half of them. It's a very clear impact. Early screening can save lives. It's, yeah that's very rewarding. We do some stuff in biotech, I'm very excited about. I think just the stuff you can do with proteins engineering them.

Through that also creating novel materials that are much better from the environment. That's the second company I'm very excited about. Cuz like 60% of what the chemical industry produces can actually be produced based on proteins, so biologically based, which is not potentially better just in material properties, but also much better for the environment. So that's really cool.

I'm excited about the manufacturing company that puts cameras and factories analyzing workflows. The, one of the two founders actually also an ETH alumni did mechanical engineering at ETH Zurich. We met actually back then. So it's cool that he came to us and is building a company with us.

Very cool. So I'm gonna ask you a few closing questions that we often ask in these podcasts. So when you go back to Zurich and you go back around the ETH, what's your favorite place to go?

It's probably I really like the, I think it was called Bequem, the bar. I remember we always sat there for drinks on Friday when there was like, in the summer, beer and the sun coming and talking to people. So I like that and probably the second place I liked is the Mensa, the lunch place at the top of ETH, the main building, which was only for PhD students.

I don't know if we were actually officially allowed, but I definitely went a lot. So that was just like great to the view from up there over the city.

[00:23:16] **Susan Kish:** That is really cool. And what are you curious about? What are you learning? What are the books you're reading or the podcasts you're listening to?

[00:23:24] **Rasmus Rothe:** On the VC investment side, I like the 20 minutes VC. I will now listen more to the a h podcast. So that's something. Yeah, the 20 minutes VC is a podcast. ETH podcast obviously I need to check out who else is on there. I'm sure there's a lot of other very interesting alumni.

Yeah, I think in, just in terms of reading, yeah, I spend a lot of time reading news, economist. And then books, there's some good books on AI. I think the AI superpowers book is a bit older, but I think it's a good classic like from Kai-Fu Lee talking about the AI of war and also the global war around that.

I think they probably should rewrite some parts of the book, but it's a very good like overview book for people to get into this space.

[00:24:05] **Susan Kish:** So if somebody wants to learn about AI and start to think about its potential, what should they be reading?

[00:24:12] **Rasmus Rothe:** Yeah, it's funny, like I had, somebody asked me the same question yesterday and he asked me also for a book. And the problem is I think a lot of the books that we've written half a year before outdated, so we probably have to wait a year or so until good books appear. What I really like reading, I think if you want to think more about business cases and use cases is the blog post from A16Z the venture capital firm, Andreessen Horowitz. They've wrote five to ten blog posts on AI and where the big businesses will be built, and How do you build B2B companies, how do you build defensibility, how will the cloud providers play a role? How will the landscape change. So I think if you spend like an hour, you can probably read most of the blog posts and that will give you, bring you very much up to speed.

[00:24:54] **Susan Kish:** Fantastic, Rasmus, thank you. That was a really interesting conversation about a topic that I think is really top of mind for a lot of us.

[00:25:02] **Rasmus Rothe:** Thanks for the great questions, Susan. Was it a lot of fun? Thanks.

[00:25:07] **Susan Kish:** I'm Susan Kish, host of the We are ETH series, telling the story, the alumni and friends of the ETH Zurich, the Swiss Federal Institute of Technology in Zurich. ETH regularly ranks amongst the top university of the world in terms of cutting edge research, science and people. The people who were there, the people who are there, and the people who will be there.

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