**Cris:** 0:00

Particularly over the last four to three years, we've seen an explosion in quality, consistency and overall resolution of image and video models, and it's been because of a few key advancements in techniques, but also more computer and more data has become accessible and available. So around three years ago we started working on this idea of creating new kinds of models for image generation, and we do collaborate sometimes with other research institutions. So we did a collaboration with the University of LNBU Munich in Germany, and that paper that we published was called Late and Diffusion. That introduced a new technique for generating images on a latent space and condition those images to a variety of different inputs.

**Craig Smith:** 0:45

Hi, I'm Craig Smith and this is Eye on AI. In this episode, I speak with Chris Valenzuela, co-founder of Runway and one of the creators of Stable Diffusion, the open source text to image model. We talked about advances in text to video models and what that means for the future, but I had this conversation literally the day before open AI introduced Sora, its incredible text to video model, so I wasn't able to speak to Chris about that. He did talk about the advancements in techniques, increased compute power and data accessibility that have made applications like Sora and Runway possible. Join us as we explore the intersection of art technology and the future of AI driven creativity. I hope you'll find the conversation as fascinating as I did. Can you start by introducing yourself? Give your background, particularly your educational background, how you started Runway, how you built Stable Diffusion.

**Cris:** 1:56

Yeah, totally so. I'm Chris Valenzuela. I'm the co-founder and the CEO of Runway. I'm from Chile originally and I moved to New York seven years ago to study at NYU, where Runway was our research work with my co-founders, who were interested in finding ways of training and creating large models for artists and creatives, and we started the company around 2018, so almost five years ago and since then we've published and made great progress on making sure models are accessible and empowering for creatives around the world Filmmakers, designers, musicians that use Runway to make anything from future films to short films. This is something I've been very passionate and deeply care about for almost now a decade of having been working on media and research for a long time, so I'm still on my way to go, but excited to see how we're changing and how many people are using Runway these days.

**Craig Smith:** 3:02

Did you study under Yan Lacoon at NYU?

**Cris:** 3:05

No, I went to art school in NYU to teach oh really yeah, I have a son that graduated from Tish. Oh nice.

**Craig Smith:** 3:14

So stable diffusion. Can you talk about how that came about? I mean, there are a few projects that kind of emerged around the same time and I've never slowed down to figure out how they're related or not related. You know there's Mid Journey and Dolly and various other models. So can you talk about how that idea started? End what was happening in the underlying research that allowed all of these to emerge kind of in the same timeframe?

**Cris:** 3:59

Yeah, absolutely so. A lot of the research and the things we're seeing these days on AI are not over net success. These are things that has been on the works for years and sometimes decades. Everyone is building on the shoulders of giants and building on other work and open source research that has been published for a lot of years now. I think particularly over the last four to three years, we've seen an explosion in quality, consistency and overall resolution of image and video models, and it's been because of a few key advancements in techniques, but also more computer and more data has become accessible and available. So around three years ago we started working on this idea of creating new kinds of models for image generation, and we do collaborate sometimes with other research institutions. So we did a collaboration with the University of LMU Munich in Germany, and that paper that we published was called Late and Deficient. That introduced a new technique for generating images on a latent space and condition those images to a variety of different inputs. That model and that set of research eventually became stable, efficient, which is just a larger version of the original Late and Deficient model. Stable Deficient was an open source research model that we've released and it's been one of the most, I guess, used and widely accessible models these days for image generation. There are other techniques also generating great images and great videos, and so we're also working towards making sure that we continue to just push the boundaries of how you can create and the kind of outputs you can make out of these models.

**Craig Smith:** 5:48

Can you talk about diffusion models? First of all, I've never actually talked to anybody about what a fusion model is and how does it relate to transformer models?

**Cris:** 6:01

It's a different research stream or those. Sometimes they overlap on some. Some ideas and a lot of the improvements on video and image quality these day comes from actually transformers based video generation and image generation models. But Deficient comes originally from a few concepts from like physics and thermodynamics and the idea is basically to train a model that's first of all adding noise to an image. You have an image of a set of specific like references of pixels. You start adding noise to that and then you train a network and being able to remove the noise from that image and you do that millions of times and the model gets really good at understanding then how to start from random noise, just a bunch of different pixels, and convert an image or create an image or generate an image out of that. It's a process that's been becoming more, I guess, widely used these days because the results have proven to be much better than previous techniques. Previous techniques were much more like. They were using things like guns that were proven to be good, but the thing with guns is they're expensive to train and to use and they're not as customizable and easy to like, move around or use as the diffusion models are. But again, it's, I think the fusions perhaps won't be like their last research researches. We use to improve the quality of models, and we're really have seen this were transformers that proven to sometimes be better than than diffusion from some tasks.

**Craig Smith:** 7:33

Yeah, Stalee of diffusion model.

**Cris:** 7:38

I think so. That is a model hasn't been like release and open source, so it's hard to look into like underneath a hood to understand how the model was restrained and created. But you could, I guess safe assumption is that it's a it's there's diffusion. There's a diffusion part of generating an image in something like that. For sure there might be also a transformer kind of factory doctor at some point in that model as well.

**Craig Smith:** 8:01

And mid journey is also a diffusion model.

**Cris:** 8:05

We don't know also either. Everyone has different techniques. Those are different like products from different companies, and everyone can have different approaches to how to solve it. You can have like educated guesses and time to approach if it's a deficient model or a transference model, but they might be using some technique here and there. That might be diffusion inspired or a deficient based.

**Craig Smith:** 8:25

Are there any other open source models for image generation, like stable diffusion?

**Cris:** 8:33

Yeah, there are a few models that the open source committee has been putting out. I think there's definitely like a lot of interest in trying to improve the quality of open source models. So, yeah, there's there's a few models from different teams and different initiatives that are trying to sometimes. Sometimes there's you know what happens there's a lot of not just pre trained models or baseline models but also fine tune models. You take an existing, for example, stable diffusion model and you tweak some parameters, you fine tune a particular data and that model gets released and so there's actually like marketplaces where you can use some of those pre trained and fine tune models and that's becoming a widely kind of like successful affording open source and community building because it doesn't require the amount of resources and compute and time that creating the first baseline or pre trained models in the first time and in the in the first case, like required. So it's my teacher for someone with like, not a lot of resources or maybe just a few GPUs to train very impactful or great models in terms of quality.

**Craig Smith:** 9:37

Stable diffusion is the largest open source community in this space. Is that right?

**Cris:** 9:43

So stable diffusion is an open source model it's. It's just a research and a paper and sort of weights and code that's been released. People have taken that model and have kind of like tinker, modified, inspire by it. There no one really like has any particular like saying on how the community grows, is more of like the committee just evolve on its own and people are building on top of that. For sure, that's how opens works and that's how opens or works for open source works for any project these days and that's kind of the idea you can build on top of each other and basically fine and discover new things.

**Craig Smith:** 10:19

Are there other models out there that have that are open source, that have license licenses available? I'm just trying to understand the landscape is you know? They're the pro-projectary models like Dalee and mid journey, and then there's stable, the fusion, which is open source, and then these licensees.

**Cris:** 10:40

That I'm too much there's a stable division, is an open source project that a few researchers, including runway, collaborate on. That's an open source model. Runway creates and builds their own models. We don't have a membership. We have nothing to do with any other company. We're just building on top of runways, like research, and so we have our own proprietary models. We have gen one and gen two, which are video models, for example. Those models are not based on any previous architecture or open source models are based on runways, on research, and those are like state of the art video models, for example, that are able to generate up to like 18 seconds of video, and those are in the same way as you were describing that or me journey. Those are models that are running on their own. There's an open source community of people who have taken some of the research trip done, but also some of the research other companies have done and have used that to build other companies or projects, and I think that's kind of the great part of research. So you can have both ends Close source and open source and, to be an example, I don't think there's a there's a peak of where you have to be 100% of one or the other, with we're being in the middle. Sometimes we open search stuff, sometimes we don't. But I don't think of it as a binary state where you either open source everything or you don't open source anything. I think for us what has worked really well in terms of research and community building has been open searching some things, like we did with Some versions of table diffusion and latent diffusion, and not open searching others, like gen two and gen one and gen two, that has and have not been open source, and so it's a different strategy and I guess we've chosen to be kind of like in the middle right and those the two versions of runway that you're talking about.

**Craig Smith:** 12:23

Those are built from scratch or runways original product. Before you got into video with was that built on top of the open source model.

**Cris:** 12:34

No, we'll, yeah, we'll offer products and research in house. We have our research company, we have a research team that's been Working on these problems now for a few years, and so we build on our own kind of like stack. We don't use their party models, wouldn't use like API is. We can just work on the core fundamentals of Our product and our research internally, and so I think, like 85% of our team these days, just research, engineering, advancing the training of these models and also the user, the use cases and the fine tuning of those as well.

**Craig Smith:** 13:07

Okay, okay, that's that's clear. So what I really wanted to talk about is the video generation, these models, and you're doing it. There's a company called pika that's doing it. Are you both using similar architectures? They completely different. And and then, of course, google and opening, everybody is coming up with their, their own version of this. So can you talk about the underlying research for video generation? Is it a completely new stream of research? Is it built on top of the diffusion architecture?

**Cris:** 13:53

it's definitely building on some of the findings that people have found around the fission models, but also transformers and other like techniques for generating Images, video percents of different Problem, which is temporal consistency how you make sure the models and the videos are consisting across different seconds of video generation, and so making sure that you can close that gap by Creating new architectures, has been kind of like the core, fundamental, like their research challenges days. You want to make sure these models understand how the world works, the physics, interactions of objects, how characters moving a scene, and that's critical to make good quality videos. Every company might take and there's different approaches so it's hard to define or tell that everyone is using one particular thing. This is more, like you know, it's like manufacturing cars people you want to build different cars and different cars can have different logistics, and my factories and the cars that might have come out of those factories might also be different based on your, what you're trying to like creating the first place. So we have a specific manufacturing facility and we make a specific version of our car, but other companies might want to try different techniques to create those cars and also output different cars, and so really for us is about improving our own models and kind of like creating the the best car experience that we, that we that we want for customers and that kind of like metaphor, analogy with of manufacturing. But there's no one single way of building a car. It can be, it can be different depending on what you're trying to do.

**Craig Smith:** 15:24

Yeah, and right now the videos generated are very short. I've seen longer form Videos generated, videos that are very Hallucinatory, you know, dream like things, sort of morph into other things. Is that what happens if you run the model that you have long enough, or? Or I mean, is there, why are you only doing?

**Cris:** 15:56

You know a few seconds so you can create up to like 18 seconds of video these days with runway, and, probably very soon, longer videos. It all depends, really, on the artistic like direction they want to take it. People, you might want to create more surreal videos or more realistic videos, and that's kind of like up to the creator of how you want to take it. But, really, like it's not limited to time, you can always extend that video for longer. The way you create those videos, though, is you can start with chunks of four seconds and then Eventually get to longer, so you might have seen specific versions of the videos in particular moments in time, but, yeah, you can create way longer videos if you want.

**Craig Smith:** 16:38

What I'm talking about, the one, these, these videos that that People have produced that are very Sort of psychedelic, because there's no consistency. Is that? Is that coming from me? Does runway produce those? What? What is going on in those videos?

**Cris:** 17:01

Yeah, I'm in talk to tell without like seeing I guess watching the videos that you have are referencing to there's there's a lot of different techniques to generating video. Some of them are More surreal, more psychedelic than others. Some people are actually creating just models to create like Psycho videos and that's that might not be using runway at all. You there's. So there's no one like singular way of creating videos in the first place. You can think about it really good analogies, to think about it as a camera. You can have different cameras to create different types of videos and scenes and it's up to you how you want to like create those. Those videos using what were particular camera cameras might work differently depending on you want to make. But we run what you can make. It's a, it's very flexible so you can make abstract shapes and surreal objects all the way up to like very realistic and almost live, live action kind of like shots.

**Craig Smith:** 17:52

Yeah, and, and so consistency is the issue right. When in as you, as you.

**Cris:** 17:59

Temporal consistency, which is, I guess, how do you make sure objects pertain and maintain their consistency across different seconds of videos?

**Craig Smith:** 18:08

And how do you do that and can you talk about the underlying architecture of your model? You said it's kind of a mix of diffusion and transformers and, and just to give you an idea of what I'm, where I'm going, you know I talk to this Company, wave AI. I'm sure you've heard of them. They they're actually an autonomous driving system, but they have a world model and that's why I asked about young look on, because he's, you know, done a lot of search research with video and world models. But they have a world model that that they train and then it can a plan and generate scenes in a representation space and then they can decode that into pixels and it's remarkably consistent. I don't know if you've seen it, but are you working with world models? Are you doing something different?

**Cris:** 19:18

Yeah, we're doing the. So we have a current effort called general world models that it's trying to solve, I guess something on a very similar spectrum, which is not a plan to solve driving cars. So the problem of self-driving cars is how do you have systems or cars that can navigate very complex physical situations to the point where they can drive themselves to avoid objects or situations that are arising on the street? The way you train that and the way you can do that from a world model's perspective is you don't decode the rules of the system. You have a system trying to figure out how the world works and how objects, kind of predicting what's going to happen next. That's the key aspect of it. If I throw a ball to a year, I can predict because perhaps I've seen enough balls going to a year that the ball at some point will start going down because of gravity For a model that's really hard to know, like the model hasn't been hard coded to know how gravity works. But our belief and thesis is, if you train models large enough and you give them enough data and with the right parameters, the model will try to learn that World models are models that not only look at particular videos or images or type of data, but they're actually trying to predict what's going to happen next. So transformer models are great for language because they basically do that. They predict the next token in a sequence of words and by doing that they're able to generate coherent language In world models. You want to do something similar with video frames, for example. You have a video frame, one particular frame. You want to predict the next one, the next one, the next one, and you do that sequentially until the point you can understand what's going on occlusion, movements, gravity of other objects as well. So our architecture behind the scenes is trying to leverage that idea. A big component of it is just very large models on the first part, but also training them in a way where all of these things do make sense for the model itself.

**Craig Smith:** 21:22

Can you talk about the level of compute necessary to train these models and how large they are at this point and how large you want them to be with the roadmap is?

**Cris:** 21:36

They're very large and they're very expensive. There's a lot of compute that's needed to train these models. I think one of the biggest expenses in research is to just compute, because these models are just very large and training them requires vast amounts of compute power. We're talking about thousands of GPUs sometimes, so we're going to have more than tens of thousands to make sure that the models perform and work at the level that you want them to perform. I think that's only going to be, to be honest, continue to increase. Over time. More compute will become more needed. At the same time, though, there's always going to be optimizations and tricks that both chip manufacturers, but also software engineers and the software layer can do to optimize how these models are trained. You can squeeze even more power out of existing GPUs. I think both efforts are happening at the same time, where more GPUs are being put into the market and, at the same time, more optimizations and better techniques for model training are going to be developed and are developed. By putting both together, you're going to have larger and bigger models come out.

**Craig Smith:** 22:40

Hi, good tech solves problems you know about. Great tech solves problems you haven't even thought about. What can the commerce platform trusted by millions of merchants do for you? It's time for Shopify, the commerce platform, revolutionizing millions of businesses worldwide. Whether you're a garage entrepreneur or IPO ready, shopify is the only tool you need to start, run and grow your business without the struggle. Shopify puts you in control of every sales channel. So whether you're selling satin sheets from Shopify's in-person point of sale system or offering organic olive oil on Shopify's all-in-one e-commerce platform, you're covered. Shopify powers 10% of all e-commerce in the United States and Shopify's truly a global force, powering all birds, rothy's and Brooklyn and millions of other entrepreneurs of every size across over 170 countries. Plus, shopify's award-winning help is there to support your success every step of the way. Sign up for a $1 per month trial period at Shopifycom. How do you measure these models? Do you measure them by parameters, the way you do an?

**Cris:** 24:03

LLM Depends on what you're measuring. If you're measuring consistency and quality, you can rely on benchmarks and evals to make sure that models perform as you want them to perform, although I'm less a fan of benchmarks and evaluations and much more of a fan of quality with humans, If you want to see how good the model is, it really doesn't matter how many parameters, how many billions of parameters the model has, or how long it's been trained. If you want to see how good the model is, just show it to a filmmaker and have them use it to see what they can make with it. That's going to be a much better indicator if you're making a good job or not, if they like it, At least from a visual standpoint. That's the goal of making these tools for artists in the first place.

**Craig Smith:** 24:46

I would presume that the larger the model and the more compute applied, the more data and the training, the better the produced video.

**Cris:** 24:58

Exactly. The larger the model, both on parameter count, and the larger the model on the data side as well, the better the model will come and the better the model will work.

**Craig Smith:** 25:07

So, on parameter count, what is your largest?

**Cris:** 25:11

model. I can't really go into too much of the details, but it's on the billions in terms of size of parameters. Yeah yeah.

**Craig Smith:** 25:22

That's not saying that much, cristobal, but because everything's in the billions these days. But yeah, and in terms of this is you're using GPUs, I would imagine, for the training.

**Cris:** 25:36

Yes, we're using mostly GPUs. These are H100s and A100s for the most part.

**Craig Smith:** 25:41

Yeah, and can you give an idea how many GPUs you have involved in the training?

**Cris:** 25:47

I can go into that level of specifics, but a lot. We have a lot of GPUs.

**Craig Smith:** 25:52

Yeah, and so where is this going? You know you've made a lot of progress. There's some other people in the market that are making progress. Where on the curve are we?

**Cris:** 26:04

I think it's early Yo. I think it's very early we're in, although in the midst of a major change in media. I think we are about to see a new kind of media that we haven't seen before. I don't think we're going to use the same word to describe it. So where we're speaking about right now filmmaking and movie and movie making we're probably not going to use the same word to describe the type of things that you can make with these models in a couple of years. And that's kind of like an interesting point, because technology will create a new art form and we've seen that in the past, and so perhaps the Tisch schools of the arts in the future might be teaching something, but just don't have a name for it yet. In the same way that perhaps filmmaking for people 150 years ago would have been unthinkable off, you can imagine that someone will study something like that. And now it's like, of course, an institution and something that's well known. And I think that's the interesting and more compelling part for me that technology is moving so fast and so quickly and so in such an affirmative way that it's not going to really change the way we see the world, but it's also going to change the way artists interact and tell, search of the world, and that's going to create, on its own, a new art form, and so, yeah, it's still the very beginnings of that transformation.

**Craig Smith:** 27:24

So right now, most of your users are commercial advertising firms. I mean, who's using Runway for video creation right now?

**Cris:** 27:38

Yeah, we have everything from directors, producers, artists, filmmakers, production teams, people in Hollywood working a lot. We have musicians, we have advertising companies and also creatives and creators independent creators, people who are just making videos for fun or for a living. It's really anyone who wants to make and tell stories. That's kind of the goal of building Runway in the first place, and it's a wide spectrum of creatives that spans from professionals to casual creators. Yeah, we have what we call like a streaming website where you can watch things people have made with Runway and that's open so we can also follow up. If you want to just see what I think people have made and this is also in the application itself when you want to generate, you can also watch and kind of get inspired by what other people are making. So by doing those things combined, you can basically get a lot of inspiration to not only watch but also create, because that's kind of the point you are now in control and you can not only view a viewer, but also you can be part of the creation process of making video like that in the first place.

**Craig Smith:** 28:39

Yeah, how is it priced? Is it priced? I mean, you're spending a lot of money to build these models and presumably your backers want to see a return. But on the other hand, if you're targeting the creative market I mean, certainly Hollywood has a lot of money, but that's not typically where the money is- I mean, we're charging.

**Cris:** 29:10

It's a license system, very basic. You can basically pay on a monthly, yearly basis and get access to unlimited resources in the tool, and there's also the ability for people to fine tune models. You can come in with particular data sets and we can help you customize the models to work much more specifically to whatever output you want, and that's something a lot of companies do ask for, because they want to have styles or consistency of objects when they're making stuff, and so we offer that as well.

**Craig Smith:** 29:40

Oh, that's interesting. So do they get an instance of the model in the cloud or something that they fine tune? How does that work?

**Cris:** 29:49

Yeah, they work with our team, with our research engineering team. They can provide us with data and we use the data to customize the model that then gets used only by them.

**Craig Smith:** 30:00

And on the issue of consistency, which is the big hurdle, can you talk about technically how you address that? How do you get a model to be consistent over time? And you said you're up to 18 seconds or so. Is the limit there maintaining consistency, or is the limit just the cost of inference or whatever it's called in this case, that it just becomes prohibitive to allow people to make longer videos?

**Cris:** 30:38

No, the cost is. I mean there's different challenges. For sure One is with cost Models haven't gotten into the space yet or optimizing them to make them faster. We're working on it, and I think other people are as well, and you will see cost going down for inference and training, so that's not really a matter of time. To be honest, that cost will continue to go down, and I think we've seen already this in language models, where running language models is now kind of possible even with your computer and your iPhone or your phone, and so that's becoming very cheap and very convenient to use. For consistency, though, for creating larger models, just training data matters a lot, but also the techniques and the tools and the systems that you can put in place to make models just have a longer window of context of how you're going to basically understand sequences of video more coherently, and there's different approaches of it. I think people are still researching on the best technique there. I don't think there's one single answer because it's still very early.

**Craig Smith:** 31:38

Yeah, you started out at Tisch, which is an arts school. How did you get into this deeply technical space? Were you a coder? Did you become a coder, or are you more on the conceptual end and you're working with people that understand the algorithm?

**Cris:** 32:10

In my previous life I studied Econ. I was working on like statistics and kind of metric analysis. Then I fell in love with programming and software engineering, which led me to fall in love with neural networks in 2015. Really early on on this new wave of research I was seeing. Then I spent two years at NYU, really in art school, but also I took classes at computer science and current and engineering schools. I went really deep into trying to merge and combine both computer science and research and arts. I was coming from pastures and interests of mine, which is just how to make sure you can build software tools that can be used by artists. That's kind of the interest that I've always had. At the time it was unique and strange, to be honest, to be able to work on art and computer science and research. Now, with the models and the quality and how many people are using the stuff that we're making, it becomes more obvious. I think that's kind of what drives all of what Romy does and how we still grow as a team. We are a team of artists and a team of researchers that share and have a common language. I think that's the core aspect of what we do and how we do it so specially. We have some of the best scientists working in these problems, but they also have a sensibility for the arts. Sometimes they're artists on their own right. At the same time, we have artists who become engineers. That allows the company to build tools in a much more different way than I think others this is going to evolve as an art form on the one hand.

**Craig Smith:** 33:51

Then also, is this tech applicable to AR and VR, or would that require an entirely different approach?

**Cris:** 34:03

I guess to answer the first question, how is it going to impact art and media? When photography first came around actually when daguerreotypes were first invented people just didn't have the word to describe it. They use this idea of a mirror with a memory because you've never seen anything like that. You weren't able to see a technology like that. It's only by being exposed to it and using it that you eventually become comfortable with exploring it creatively. I think that's pretty close to where we are right now, where people are still in the mirror with a memory phase of AI. Only by having artists and creatives using it you're going to see how it's going to impact their own craft and their art practice. That's a lot of. What we need to do is get this into the hands of more people.

**Craig Smith:** 34:45

Is this tech applicable to AR and VR, or would it require an entirely different?

**Cris:** 34:52

I think it will for sure. If you think about pixel generation in a VR and AR environment, you're also generating pixels. The way you can generate them can be different. This is a new way of generating pixels. If you just think about it in a more fundamental way, you can find ways of applying, or this thing being applicable, to also generating pixels in a VR environment. I think it's still early. I think I've seen a few experiments here and there, but it definitely will be an area of growth where people are going to start merging and combining more of those two spaces.

**Craig Smith:** 35:24

For people that are using your models? What is the interface? How do you manipulate what you want?

**Cris:** 35:35

It's an interface that allows you to do things with a combination of different inputs. You can use text, for example language, another language, to describe something you want to create and the model would create it for you. You can also use an image as a reference. Use an image and then use perhaps a language description to animate that image. You can also use, sometimes, tools. We have something called motion brush that allows you to move particular objects by brushing over them and then defining movements in particular directions. There's no one singular input or way you can make them. It's super expressive and you can take different routes on how you want to make that work.

**Craig Smith:** 36:11

Are you using the tool you were in in art school? Are you an artist?

**Cris:** 36:18

Yeah, of course, these are the tools I've always wanted to use. I'm a user of everything we build. That's also common in our team as well. A lot of our team members just use the tools every day because these are the tools they've always wanted to use.

**Craig Smith:** 36:37

Yeah, is it just for the creation of art or are you using it in producing some commercially?

**Cris:** 36:48

It's more of a self-creative expression. I'm not making movies and I'm selling those movies. It's more of being able to make something and perhaps take an idea out of your head and putting out a leg. That's the goal, ultimately, of making something like runway. You want to make sure that if you're thinking about an idea and you want to express that idea, technology should be able to allow you to do that without any hurdles or processes or time constraints. It's a unique opportunity to be able to think about something and immediately see it, visualise or get it done or be able to experience it. That's kind of the goal allowing people to do that way more often and more constantly.

**Craig Smith:** 37:32

If that makes sense you mentioned Hollywood. I don't know if you mentioned it, but advertising agencies and then creators, which is the biggest community that you see.

**Cris:** 37:47

Definitely, definitely. Folks in Hollywood in production teams have been a big source of growth for us, but also musicians these days are using runway a lot. We have major musicians and artists using runway to make music videos and also the visual for their tours as well. I think those are probably going to continue to grow a lot, but I'm also excited to have this be used by maybe folks that never thought of themselves as artists in the first place because they were far away from being able to access any of the outputs of these models or the things that you can make with it. I think, long term, I'm also excited to see the next generation of artists that when emerge from it, and I think we still have a long way to go to make sure that happens.

**Craig Smith:** 38:29

Yeah. And how big is the community of people using it? Is it thousands, tens of thousands, hundreds of thousands? In the millions, in the millions, yeah, yes, multiple millions. And in terms of the generation of the images, I was at I don't know if you went to NURUPS this year, oh, there, okay, the University of Toronto, their drama department, has an AI lab and they had. There was a creative day where they had exhibitions of different creators doing things with AI and they had a poet from New York and and he, as he read his poetry, there was a screen behind him that would morph and blur and images would appear that were related to the words in, either in a literal sense or in terms of emotion. Could runway do that? Can you run live on conversational prompts?

**Cris:** 39:56

You can do live interactions, I think it's. I mean, I don't know what model they were using, but we've seen a lot of interesting experiments using models in a real-time environment for performances, for dance experiences, but also for music. I think it's a whole area of research and work, but yeah, there's definitely people who have done it in real-time basis.

**Craig Smith:** 40:21

Yeah, what's the most impressive video that you've seen come out of runway?

**Cris:** 40:29

You know, every two weeks there's something new that just blows my mind. So that's really the idea. Really like that, something that you thought was going to be like just impossible, very hard, like immediately becomes like visible and then the standards and the way you can project how the runway will move starts to move on its own. So, yeah, every two weeks there's something that just blows my mind, or some major artist or creator or filmmaker who's using runway, and I think that's kind of the point. We need to do more of that.

**Craig Smith:** 40:58

Do you have some place where people can upvote so that the most popular videos are easily discoverable?

**Cris:** 41:08

Yes, we have a few things. First of all, we have a film festival every year in New York and LA that highlights and showcases the past of the past of AI filmmaking, or people making stories and videos with AI. That film festival is coming now in May in LA and New York and we already have thousands of submissions from all over the world of people making stuff with runway. The first version of this we did it a year ago at New York. We had traditional filmmakers come in and speak about how they've been working with runway and other tools, and we also highlight and show some of the stuff people were making with what we're making. So that and its own. I think it's a great summary and we can continue more of that. You can also watch the previous winners and to get a sense of where things are and where things are going to go. And then we have ongoing competition, actually this week called Jane 48, which you get 48 hours to make a film, and we also have thousands of submissions from people over the world to showcase what you can do with it and people can vote on the ones they like the most.

**Craig Smith:** 42:10

Yeah, well, I'll be sure and go to the New York version of the festival. That sounds fascinating. So you have of the video generation. You have two versions of the model, or two generations is what you said.

**Cris:** 42:27

Yes, we have two generations of the model so far. So Gen 1 was the first generation, gen 2 was the second generation, and then, of course, more generations are coming very soon, and every generation introduces new quality improvements, control and a few other tricks here and there.

**Craig Smith:** 42:42

Yeah, when can we expect the next generation and what is the cadence of putting out new generation? Is it getting easier?

**Cris:** 42:52

I mean, there's no particular specific cadence that we keep on repeating. I think we just want to make sure the models are safe and reliable and controllable, but the next generation of models will come very, very soon. At the same time, this is impacting like artists and creatives all over the world, and so highlighting their work, for example, in things like the AI film festival, for us is just fundamental, and so, yeah, if you want to go to the New York one, you should definitely try to make it, because it's going to serve as a historical moment in time for us to understand this new type of media that we're discussing and a new type of artists that will emerge out of using these technologies. Art has always been about technology. I mean, from the very beginning of the first ever paintings in caves, people were using some sort of technology pigments or something to describe the world they're seeing. A paintbrush is a technology, a camera is a technology. These algorithms are another form of technology, and so I think battling or putting the artists against a technology is not really the case. I think we should be much more thinking about how does technology augment artists in the first place, and technology in its own doesn't make things. It's people using the technology that make things, and so really embracing it and thinking about it as another paintbrush, another creative tool in your stack is perhaps the best way to think about it. Of course, sometimes you get tensions or afraid of trying new things because you've never tried them before, but that's just like part of the process. Sometimes you start trying it and you get used to it. You understand that it's all about your own intentions and goals. So, yeah, I've seen that before. People are becoming afraid of it. But again, people were afraid of cameras. People were afraid of a lot of other things that now are commonplace.

**Craig Smith:** 44:44

Yeah, yeah, Okay. Well, Chris, this is just fascinating, really. That's it for this episode. I want to thank Chris for his time. If you want to read a transcript of today's conversation, you can find one on our website. I on AI, that's EYE-ONAI. And in the meantime, remember the singularity may not be near.