Jensen Huang on Vision, Risk, and the GPU | Only In America

38 MIN · YOUTUBE · HTTPS://WWW.YOUTUBE.COM/WATCH?V=ZEL0EAVTCTY
https://www.youtube.com/watch?v=ZEL0EAVtCTY

My parents had nothing. Um, sold everything. Came to America. That was the beginning. Along the way, uh, the jobs I had, the schools I went to, the opportunities I had, and here we are, Nvidia being the most consequential technology company in the world. This can't possibly happen anywhere else. America leads the world in technological innovation. This innovation taking place all around us in Silicon Valley is possible here because of our American freedoms. But to take advantage of the opportunities that freedom affords us, it requires taking risk and facing the unknown with courage and determination.

Jensen Wong, the founding CEO of Nvidia, had a vision, took significant risk, and now leads an iconic American business, driving change at the heart of global technology. His journey as an immigrant is fascinating, and it has so much to tell us about our country and what makes it exceptional. America presented the opportunities that enabled Jensen's risk-taking to change the world. Now for Only in America, my conversation with Jensen Wong.

the amazing Condandy Rice. >> I'm in uniform. >> How are you? Good to see you. >> Nice to see you. >> Nice to see you, too. >> Welcome. >> Thank you. >> What do you think about our new building? >> I think this is amazing. This is this is a building that is only possible with science and a supercomput, >> right? It's fantastic. >> This was completely built in a simulation first. >> You're kidding. >> This building is designed so that we make maximum use of this incredible space called California.

>> And so we decided, let's use the space for the beautiful sunlight and the weather. And this entire space is very energy efficient. So we use the maximum amount of sunlight >> and that's why there are light wells on the roof. >> But when you have light wells in the roof, >> yeah, >> it is extremely difficult to remove the heat. >> And so notice >> where the triangles are, the light wells are only where it needs to be.

>> I see. >> And and the roof looks flat to us from here, >> but is undulated >> to track the sun. So it lets sun in just enough but doesn't let any more sunlight in than is needed. Otherwise, we'll have to remove the heat. >> So hot. So it's completely efficient then. >> Completely efficient. We simulated this building every single hour day, >> right, >> through a simulation of the entire year >> and we moved everything until it was perfect. Perfectly harmonious mathematically.

>> Well, I would expect that of you, Jensen. >> That's an engineer trying to be an architect. >> I like it. I like it. Yeah. >> And the undulation, this one creates a baseball cap. And the reason for that is because you could see

during in the in the afternoon when the sun's about to set, it comes right into the building. >> Okay. >> And so I sloped the walls >> to move the offices >> Yeah.

>> further back in. And so this is the baseball cap of the building >> and it fits right into the beautiful design. If you make me look too put together, everybody knows it's fake. >> I've got to be a little wiki wonky. >> Okay. >> Something's got to be a little off. >> There it is. >> Yep. >> You still call you Madam Secretary?

>> Uh, no. You're going to be good. >> Would you like >> I tell I tell people or uh I'm I'm good for now. I I tell people Madam Secretary was a while ago. Uh Dr. Rice was my father and Professor Rice is with my students. So I think that leaves us with Connie. >> My goodness, that's a lot of good titles. >> Jensen Wong, thank you. Thank you for having me here at this beautiful Nvidia campus. Uh you and I have known each other a very long time and uh have a lot of ties, Stanford ties and the like. So I'm really looking forward to our conversation, but let me start with with um this young kid what nine comes to the United States of America. America is in many ways a one big immigrant story.

very different stories but one big story of people who come seeking a better life, people who believe that their children are going to do better. So talk about arriving here. It couldn't have been couldn't have been easy. >> I was born in Taiwan when I was five. My uh father got a job in Thailand to start help start an oil refinery. And so uh we moved to Thailand. We were there for about four years. In 1973 there was a coup as it happens every now and then.

And uh my parents thought it was unsafe for us to be there. Uh my older brother was one year older than me. He was 10. I was nine. My parents uh wanted to send us out as soon as possible. And so they got our uncle who lives in uh Washington, Tacoma, Washington, to take us for a little while. My first impression was was I'd never stood in a house with carpets before. And it was the strangest feeling. I felt like I was walking on my bed with my shoes on and and just everything from everything from cereal and the morning television speed racer and in the afternoon partridge family and you know all the candy the Snickers bars everything was like I I couldn't imagine what this amazing country was and everything was so beautiful the cars everything was just incredible and uh we were in Tokoma Washington for about three months And then they sent us to uh the most affordable, accessible boarding school in America because my parents couldn't afford much. A wonderful school. They welcomed students um of all backgrounds.

Uh many from from uh difficult homes uh some international kids and that's how we were able to come. They they sponsored us and allowed us to uh come to United States and stay in that boarding school and I was there for about two years in Onita, Kentucky. >> I have never heard of Onita, Kentucky till this particular moment. If you look if you look at Onita, Kentucky uh in Google Maps, the the beautiful thing is there's nothing around it.

>> It's just one little dot. I think it's when I was there was probably population 600. It's probably population 600 now. Uh beautiful, incredible. Um I had a wonderful, wonderful childhood there. It was very difficult and very scary coming to United States by yourself. But I it's amazing what my older brother did. Frankly, I just followed him around. He was 10 years old. Could you imagine a 10-year-old um bringing along a 9-year-old uh traveled

all the way from Thailand, never been to the United States, landed in Tacoma, Washington and and went to went to Kentucky, but laid over in Chicago.

>> Oh my goodness. >> The the airport Chicago airport is gigantic. And so we had to go find a connecting flight and >> uh he you know, a 10-year-old did all that by himself. My older brother's incredible. >> Just amazing. So this was risky in a lot of ways, but your parents felt that the greater risk would be to stay where you were. How were you treated? Were people friendly? Were they surprised? How how did how did that part of it go?

>> You know, 1973 United States um in Kentucky there were all there were still biases and and um nobody had the school had never seen this Chinese kid before, >> right? uh wonderful kids there, but but um none of them ever seen a Chinese before and and so there were there were all of the things that that comes along with, you know, being a stranger in a town where nobody's ever seen some someone like you before. And so there's a lot of biases and of course things like that, but kids are kids. And so for us at the time, I you know, United States was amazing and I was part of the swim team and I was part of the soccer team and and and um the the food was was interesting and you know, sausage and gravy. Who wouldn't like that? you know, hamburgers and uh and after swim meet, the the the coach just took us to the most amazing restaurant in the world and the food came in boxes and the menu was all lit up and and we sat we sat in a restaurant that seemed like a spaceship >> and it was McDonald's.

>> McDonald's, right? you know and and so so I think it's really all about expectations in life you know when you came from a even more difficult circumstance that's the thing about immigrants is that that when you come into when you come to America you came because of choice you wanted to be here my my dad sent us here but in fact when I was four years old he had the opportunity to come to to be trained in the United States and turned out the place he came to was New York >> could you imagine to come to the United States and it's New York City from Taiwan in the 60s. And so he he always said that he wanted his family to eventually come to America to come to this incredible place. So the thing that's really great about immigrants is you came with very little expectation.

You came with great hopes and dreams. You you appreciate everything. come with a sense of gratitude for where you are and the new opportunities. >> Exactly. And and this this miracle that you're witnessing. I remember very clearly >> what it's like to see America for the first time, this miracle and all these people and how welcoming they are and >> to see it through those eyes. But then of course you go from this little kid in Kentucky, you're on the swim team, uh the soccer sounds like you were doing okay in >> I was a good athlete. Yeah, I was a good athlete. And and so we met our parents back in Tacoma, Washington. Um they they they had nothing and literally they put all their belongings on the plane. So they had nothing and they came with the you know, literally the suitcase. I mean that story, the immigrant story and and they saved their way to to uh build a life for their kids. My mom was a a maid at a Catholic school. Uh and uh my father was an engineer. Uh they saved everything they had. My dad uh bought a green truck, a a um a van, and um there were there were no seats in it, so he put a carpet in the back and put some milk crates. Uh we got into the to that green van and he drove us all the way from Oregon down to LA so that we could go see Disneyland. And um that was the one vacation of our family.

>> How did you end up going on to college and then Stanford and how does and working at Denny's which we have to cover at some point. >> I know I I I must be Denny's best ambassador. >> Yeah, I think you are definitely. >> No, I I love Denny so much. uh it never occurred to me uh to be able to afford or or you know go anywhere for college and and so so it was it was always just my plan that I would grow up in Oregon and um I loved math. I love science and when you're in high school and you love math and science you're you're only going to have three other friends who also love math and science and >> science, right?

>> And so the the two or three friends of ours, we were all in a club so that we were in a math club. We were also in the science club, right? >> And then we were in the computer club >> all together >> all together. And so and then afterwards after, you know, clubbing, we would we would go play played arcade games, you know, play pinball or go play at arcade games. And and that that was that was growing up. And u my best friend uh Dean Verhiden, he uh he said, you know, I'm just going to go to Oregon State University. my my uh my brother went there, my parents went there, and I said, "That sounds great." Oregon State had a good engineering program. That was just good happen stance. Um I loved the school. And it turned out that um uh there was another kid there, Lori.

She was one of three girls in a in a school of in a class of 250 other boys, >> right? >> And um and and she was, you know, she was I was the youngest kid in school. I was only 16. and uh she was a year and a half older than me and and um I I was I was determined to to uh uh to go, you know, meet her. And so I, you know, statistically weeded out everybody by getting myself maneuvered into her lab class. So now I've reduced the population from 250 competition from 250 to four.

>> That's quite clever. >> That's very clever. That was very strategic even when I was a kid. >> And uh well I knew I knew odds and and uh and then and then you know I gave her the ultimate pickup line. I asked her if she wanted to see my homework. >> That that that was so smooth and that was really smooth of you to do. >> I cinched it and and so so uh uh so we've been together ever since.

>> That's great. So that's when you met. >> Yeah, we met. We've been in college. So you're in you're in Corvalis, Oregon State. You are doing well in school. How does Stanford come onto your radar screen? >> Uh I always wanted to go to a great school. you know, I always imagined, you know, getting a masters and, uh, but I never imagined that I could afford it. And so, uh, during Oregon State, uh, the recruiters came from Silicon Valley. And so, I I took a job at AMD and, um, uh, and that was that was a really good choice because because, uh, the work was really interesting. I wrote really great colleagues and and they had this this um a program where you could go to Stanford and work at AMD and they paid everything and so >> see >> and so it was an incredible thing. So when I was being when they were pitching the offer to me, they said I said, "Hang on a second. I can go to I can work at A&D. You're going to pay me a great salary and you're going to pay me to go to Stanford >> at the same time." And they said, "Yep."

>> You said, "That sounds good. >> That sounds like like a dream come true." So I took that job. And then of course a year later, Lori graduated. We got married and um I and then life started. So I uh I took some classes, took some time off, took some classes, took some time off and altogether it must have taken me some eight years

to gra I'm I'm probably the longest running student at Stanford. Nobody paid Stanford more. I just for the education and uh along the way Spencer Madison came and along the way I I founded Nvidia and literally during my entire tenure you know during that time of of uh being at Stanford my life happened.

>> Yeah. when you're when you're going to school, you think that this school work is awfully academic. And the reason for that is because you're not sure whether there's any purpose and any benefit in learning this, but the benefit of working and going to school at the same time, especially Stanford. I could see so much of the principles being taught and how important it is in everything that I do today. And so it was it was a great privilege to have all of that happening to me at the same time. my family, my kids, my company, Stanford, you know, working all of it kind of in one giant soup.

>> People talk about Silicon Valley and uh the ecosystem and so forth. But you just used a really great term. It is really kind of a big stew, is it? And you meet very interesting people and they change your thinking about something and that leads to something. It sounds like Stanford uh was a place like that for you. It completely shaped my attitude and my perspective about computer science >> and its impact to industry >> right >> and it's in and and industrial strategies >> um um that that entire intersection between technology applications um the fundamental science and the strategies of computer science really for me formulated in that during that time >> right >> and it was really cool >> now talk about the founding of Nvidia you The early day founder stories are are really fascinating because you have to take a you have to take a chance. You take a risk.

>> Uh you you don't know if it's going to work out. But but but what was the kernel that made you and your co-founders think maybe we have something here >> during that time? It was at the beginning of the PC revolution. It was the beginning of really Moore's law, the beginning of the CPU era, this incredible technology engine that really changed everything. All of all of that in Silicon Valley was all about CPUs. Everything was about general purpose computing. Everything was about CPUs.

Everything was about Moors law. Everything was about the PC. And there were two simultaneous ideas that that Chris Curs and I were were considering. And one idea of course is every application that's interesting and meaningful um can it be run on a CPU? and and we we believe that that there were so many interesting problems to solve whether it's uh real-time computer graphics which is at the time one of the hardest problems to do in computer science or simulation or other things beyond that um a normal computer like a CPU can't possibly be the right format and so we imagine that there would be a way to accelerate the CPU offload the work that is not suitable for general purpose things. It's kind of like in your house, you only have one tool, one tool in the kitchen. Or you go into your garage, there's only one tool in your garage. You come to your company, there's only one tool. You know, there's there's a there's the right tool for the right job. And we we believe that there's there's a a another tool that could augment the CPU and make that computer essentially a superco computer >> and right >> and and um so that was that's one idea.

The second idea was was how do we even get this company started? The problem is the CPU at this point general purpose computing as of today is probably about 64 years old. And so the nature of the computer industry is that if you create an if you create an architecture that produces benefits to applications, the install

base goes up, the sales goes up. Um applications use more of it. this positive virtual cycle would cause the two to reinforce itself.

>> And so in fact over the course of the last 64 years there so many applications are built on top of the CPU. How do you even cause the application developers to consider another architecture >> architecture right? >> That chicken or egg problem is incredibly hard to solve and has never been solved. In fact, aside from Nvidia today really everything else runs on CPUs, >> right? and and so the idea that we would get this new architecture to be um adopted by developers was incredibly hard. And so the question is what's the first application, >> right?

>> And so which brought Nvidia to its second idea which was maybe the first application is computer graphics. >> But the problem is computer graphics was such a small market at the time. It was just silicon graphics. >> Right. Right. And Silicon Graphics was such a it was a large company but by by the the standards of computer architecture is very very small. And so the question is how do we find an application that would on the one hand need this architecture >> on the other hand be sufficiently high volume to cause this architecture to proliferate.

>> Right. Right. >> And so we thought maybe 3D graphics for video games. Computer games are not only fun, but they perhaps more than any other application push the edge of computing power. Most PC upgrades for consumers are driven not by the grown-ups in the house, but by the kids who want a more powerful gaming machine. All right, so you've got the brand new GeForce 3 graphics card here. >> That's exactly right. The GeForce 3 is the the latest generation graphics processor from Nvidia. So, this product actually includes a 57 million transistor graphics processor. uh to put that in perspective that's that's more transistors than a pennium four plus a pennium three put together >> I just described a business plan >> that is impossible to fund >> and it it was I still remember explaining it everybody's going yeah but you know this and that this requires this be solved and have multiple chicken and eggs and yet Silicon Valley right here San Hill Road would finance me and Sutter Hill right would be investors in this company and that that we would be able to attract the brightest minds, the brightest computer scientists in the world to come work here.

>> Yeah. >> But we were just determined that on first principled basis, the general purpose computer cannot possibly be the only computing platform, >> right? >> And that there were too many interesting problems that we could solve if we were to introduce this new idea. >> What's key about this is it's programmable. >> That's exactly right. For the first time, the graphics processor is as programmable as the CPU. We have an instruction set just like the Intel processors have an instruction set that you can program Microsoft Word or Windows with. We now have an instruction set that game programmers can program to create special effects on our process.

>> So you literally were swimming upstream on this people. You were trying to convince >> for 30 years. >> For 30 years. >> Yeah. >> But then something happens and the problem that you've solved it turns out has many other applications. Nvidia, the best way to play the netbook explosion. That's right, NVDA. First of all, the company understands the netbook opportunity. Quote, there's more and more people proving that they want to be able to take the computer with them.

Nvidia came to us many months ago and talked to us about an amazing graphics part that they wanted to build and we said this is fantastic but we'd like to use it in a notebook. Can we work together on this? And we've been working together with Nvidia for many many months and they've created something really great. I remember listening to you uh at Stanford at at a talk and you said we just kept trying to solve hard problems.

>> Computer graphics is basically a simulation of the world. >> It's a simulation problem. In a lot of ways, artificial intelligence is a simulation of the mind, simulation of the brain. And so the computation of simulation can be done not completely but largely in parallel. And so the the architecture the processor that you want to use for simulation versus the architecture used for task execution a recipe is step one step two step three. In the case of simulation, the world is happening concurrently and in parallel all at the same time right now, >> right?

>> And so on that first principle, you would think that simulation of the world, whether it's quantum, Newtonian or otherwise, um should be something that is a different architecture than recipe execution and instruction execution. And so that's the big big idea. Now the the the question then is how do you manifest that idea in technology? number one. Number two, how do you go find application for it? And so we found of course the first application computer graphics. The second application was seismic processing or inverse physics, CT reconstruction, ultrasound, seismic, very similar problems. The next problem we found was molecular dynamics, Newtonian physics. And you know on and on and on and on and we just kept finding one problem after another. And then one day some researchers, one at Stanford, Andrew Wang, um Jeff Hinton at the University of Toronto, Yan Lun over at New York University, they were all trying to solve for a similar problem which is deep learning >> and they reached out to us and um uh I you know being alert uh I realized that this is a problem that we could really make a contribution to and I was happy to help and and um uh because of the work that we did together. Uh it achieved a level of computer vision capability that no one had ever imagined.

And because of its success uh it triggered even further introspection. Why does it work? What else can it do? How far can it go? What is the implication to computer science? What is the implication to the whole industry that we're built on? And so step by step by step, we broke everything down to its first principles. And then we rebuilt back where Nvidia is going to be in that world. How do we apply all of the techniques that we know?

How do we navigate step by step so that on the one hand we can pursue this unknown future? And so all of this is about reasoning, vision, strategy, discipline, patience, >> belief. >> Belief at the core of grit, >> right? >> We suffered our way here. >> Yeah. >> You know, we suffered every single step of the way. We suffered our way here because nobody believed in it, >> right? >> So, we had the benefit of building all of this for a decade before anybody even paid attention. The hard part of course is that you're endeavoring something that has no positive feedback, right?

>> No external motivation. >> How how do you stay mo and how did your employees stay motivated? Because there was this period of time >> where Nvidia was it was not on the tip of the tongue of anybody uh here in the valley. All kinds of other things were going on. >> Yeah. How did you stay not just you stay focused but how did you keep a workforce believing and people believing uh engineers believing that this was that must have been a

a tough inspirational speech at some time. How do you do that?

>> First of all we have to believe in what we're doing. >> We have to go back to our core values as you know in almost everything great that's done. You have to go back to your core foundations. You have to demonstrate that that you are determined to go pursue that. That you see that future in your mind's eye even though nobody else can. >> You see that future in your mind's eye. You have to tell the story so that everybody else could see it in their mind's eye. And you have to believe it yourself. Welcome to the world's first conference dedicated to our industry, dedicated to the visual computing industry. Welcome to GTC 2010.

GTC is all about the celebration of the wonderful discoveries and amazing inventions that are made possible because of the GPU computing revolution. GTC is a celebration of your work. It has to first start from what do you what are your core beliefs? For what reason do you believe this future will happen? You could say that about America. You could say that about Stanford. You could say that about Nvidia. America has core foundations.

You know, we we spoke a little bit about it. Um, uh, the American dream has a core foundation. There's a reason why it exists. There's a purpose that drives it. There's a promise of it. There are pillars that keeps it up. When you see the world from my from my lens, when you see America from my lens and when you see America now today as I travel around the world and see America from the lens of everywhere I've been and the countries that aspire to be us, the industries that would aspire to want to be part of our industry, you know, it it is just genuinely a miracle.

>> It is a miracle. And um I I very often I teach young people of course and uh sometimes I think that uh some of this has gotten lost. There is something about this risk takingaking this willing to fail. The fact that you are in a place where you'll get a second chance. Uh the role of free speech, the role of laws that are reliable, that is really quite extraordinary.

>> Exactly. We have a word for that. We call it freedom. >> We call it freedom. And that freedom has enabled so much. >> That's right. >> Uh what would you say to these young people? Because there is unfortunately right now among my students uh there there's a kind of uh fearfulness. there's a kind of sense of u I'm not going to be able to achieve those things. Uh maybe this world whether it's I won't have a job because of AI or is that American dream still really there.

What would you what would you say to them? >> I would always retreat back to first principles. I would always reason from first principles when I'm uncertain about the future when things are moving too fast. You always go back to first principles. What are my core values? What makes me great today? what do I aspire for? And to go back to that, I I would say to to young people that it's possible to have multiple feelings at the same time. It's possible to be grateful for everything that you have, to be unsatisfied with where we are at, and to have aspirations for greatness.

You you're allowed to have all of those feelings at exactly the same time. doing technology change, doing world

change is the only opportunity for greatness. Status quo, you know, it's really hard to make a difference. And and so I would I would deeply dive into the capabilities of artificial intelligence and use it in every possible way. And and and it's not just about master of science, mastery of science, but it's about mastery of using artificial intelligence in my field of science.

Your purpose, if you decide to go into medicine, is to care for people. It's different than studying a radiology scan. Your purpose as an engineer is to either solve a known problem or discover problems that have never been solved, that are worthy to be solved. There's a fundamental difference between the tasks that we do in our job versus the purpose of our job. Everybody's purpose, every job's purpose surprisingly consists of tasks but not defined by the tasks.

>> Let's talk about um AI actually. Yeah. >> Uh because um you are foundational now to that entire revolution. >> Yeah. >> But you're you're an optimist about Yeah. the technology. >> Cautious optimist. >> Cautious. Well, describe for me cautious optimism because there's some people who are kind of we all we've lived in the valley a long time. There are people who are kind of wildeyed optimists as well. But talk to me about what cautious optimism means and how you think about that.

>> Yeah, intelligence is foundational to every aspect of society, every aspect of industry, everything we endeavor. In almost everything that we do, the fundamental ingredient is intelligence. Now, of course, we have to be cautious. We have to be cautious so that we advance the technology as quickly as we can so that it works as we promised. >> So that it's functional as we expect. >> So that it doesn't produce intelligence that is sounds like it's intelligence, but it's not. It's flawed.

>> Functional things are safer. >> I want my car to function as promised. AI needs to function as promised. what when you think about this whole question um internationally and the like uh what concerned you about where we are now? >> I think that one of the challenges is to define what is AI. >> That is probably one of the most there's a lot of different ways to think about the technology but one way to think about it is like a five layer cake and we have to win every single layer.

>> The first layer is just energy energy land power and shell >> first layer. Second layer is the chipsson layer where I'm at. >> The third layer is the infrastructure layer which is kind of like cloud services. >> The next layer above that is the AI model layer. This is where everybody talks. >> Yes. Right. >> But it's not the only layer. >> Everything everything about that layer is very important. But ultimately the most important layer to our nation is the layer above that >> which is the application layer.

>> Right. Using AI for health care, using AI for military applications, using for defense, for cyber security, using AI for transportation, for manufacturing, that is what's going to drive our industry forward. But I do think that our nation also has to take it be very alert that this is a very important time >> and although we are ahead um although we are the world leader during an inflection in technology this is exactly when leadership can change and that we have to make sure that as we uh come up with policies we don't hinder the most important layer which is the highest layer the application rate >> right >> that is the layer that whoever advances that layer most

will exploit this industrial revolution the most.

>> Somebody comes here from Taiwan, they're nine, they end up in Kentucky of all places. >> Yeah. >> Uh they somehow go to Oregon State because their friend goes to Oregon State and the family's there. And then they go to Stanford because uh somebody will pay for it. You meet a collection of people who uh are kind of uh intellectual uh genius geniuses, but they're a push on your own in >> That's right. >> Uh you >> I'm the I'm the bus boy at Denny's that met up with Chris and Curtis, the two geniuses. I mean, that's how the story goes.

>> That's the story, right? And you found this company on an idea. >> So, while before this idea actually shows that you were right. >> Does that happen only in America? because of some of those foundational institutions ideas that you talked about. >> I I think that it's a chain of extremely low probability events >> that leads to invasion. >> Yeah.

>> And without the tailwind that America provides, >> America provides tailwind, not headwind, >> you know, it provides tailwind. uh laws and rules that are that are understandable and that you can count on a business environment, an industrial environment with people playing by the rules that you can understand and count on. You know, when everybody's playing by the rules because the rules and rules and laws are for good reason, then at least you could find where there are segments of the market that are underserved >> and that you can rely on that. You can rely on the fact that you can create something great and um take it to market in a way that serves a market that has a demand and that it wouldn't be foreclosed on you, randomly, arbitrarily, unknowingly, you know, unpredictably.

Um those those things that that um uh entrepreneurs rely on, you know, are alive and well here. >> You know, as a as an immigrant, you come here by choice. You witness a miracle because compared to where you came from, the circumstances you came from, it is a miracle. The resources are incredible, are abundant. You want to work hard because you're desperate to succeed. An entrepreneur, you're desperate to succeed. If you don't work hard every single day, you will perish. The entrepreneurial spirit, the immigrant spirit is rather similar, actually.

>> Very similar. Yeah. Right. You have the same feelings. Yeah, >> I am certain my feelings about Nvidia and my constant desperation to do better >> is exactly the same feelings my parents have >> to secure a living for their family. They have nothing else to rely on, nothing to fall back to. I can't imagine a another place where this is possible. >> Yeah. >> You know, this is genuinely Nvidia genuinely is a only in America story in a lot of ways. I'm a only in America story. This is in one lifetime. I'm not talking about a fifth generation thing.

I'm not talking about third generation thing. This all in one body in one generation >> with parents that gave up everything to be here with no way to fall back. And they sacrificed their whole life to build a life for their children so that we could have more opportunities than they did and for a country to create the opportunities for me and all the resources, the systems, the institution, the foundation that makes a company like Nvidia to be possible. I am the embodiment of the American dream.