Center for Strategic and International Studies

TRANSCRIPT

Event

"NVIDIA's Jensen Huang on Securing American Leadership on AI"

DATE

Wednesday, December 3, 2025 at 5:00 p.m. ET

FEATURING

Jensen Huang

Founder and CEO, NVIDIA

CSIS EXPERTS

John Hamre

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Transcript By
Superior Transcriptions LLC
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John J. Hamre: Well, welcome to all of you out in cyberspace. And I have a wonderful collection of colleagues here in physical space. And we're going to have an interesting conversation with Jensen Huang. I would waste your time by introducing him. You know, everybody knows Jensen. But what you may not know is that he started from fairly humble roots. Your mom was a schoolteacher. Your dad was a petroleum engineer. You and I share one thing in common. That's we both started off – our first job was running a dishwashing machine in a restaurant.

Jensen Huang: Denny's. What was – what was your restaurant?

Dr. Hamre: (Laughs.) It was at Mount Rushmore, of all things. But you did better than I did. You became – he became a busboy, and later a waiter, and then, I guess, led him to NVIDIA. (Laughter.) You know, it's a remarkable story. I think it's the quintessential American story.

Mr. Huang: It is.

Dr. Hamre: That, you know, we welcome people who come with just energy and imagination and creativity, and they make an astounding success.

Mr. Huang: Thank you.

Dr. Hamre: And congratulations. And thank you. Thank you for joining us. We're going to – we're going to have a very interesting conversation today, colleagues. And, you know, it's – NVIDIA's not only a huge economic success, but it's a national security platform. And I think we want to talk about that today. I've been looking at your – at your website. And you do talk about NVIDIA as being a platform. What does that mean?

Mr. Huang: A platform. A platform is something that you build other things upon. NVIDIA is the largest pure play technology company the United States has ever seen. In fact, we're the largest pure play technology company the world's ever known. We create technology out of nothing. Our final product is pure technology. And in order to use it, you have to create software and applications for various industries above it. Now, if you look at most of the technology companies today, some of it could be in social media, some of it could be in e-commerce, some of it could be in information search. And these are all amazing technology companies whose business models are something else. Our business model is purely technology.

Now, the way that AI works and our technology works is that, in the final analysis, the technology platform is built in layers. And that's one of the reasons why we think of it as a platform. You're standing on top of it. An application or an industry stands on top of that platform. That platform starts with energy on the bottom. One of the reasons why this administration has made such a huge difference right away is its pro-energy growth initiative. Its attitude about energy is that if we don't have energy we can't enable this new industry to thrive. It is absolutely true. So layer one is energy.

Layer two are essentially the chips and systems, but the chips. That's where NVIDIA comes in. Layer three is a whole bunch of software. And we build a whole bunch of software on top of our chips. And we're well known for this piece of software called CUDA, but there's hundreds of different pieces of software that we create that enables people to do AI for different fields of science, or language, or images, or whatever it happens to be – robotics and manufacturing and such. But that third layer is called infrastructure, basically software.

Now people historically have thought of infrastructure really as the cloud. But increasingly it's really important to realize that infrastructure includes land, power, shell, because these are – and I'll speak about this in a second – that this industry spawn another industry altogether. And I'll come back to that. But the third layer is basically infrastructure. And that infrastructure includes financial services, because it takes an enormous amount of capital to do what we do. And, historically, all of that software.

The layer above that – and this is where people largely focus on when they talk about AI, which is the AI models. This is the revolutionary, of course, ChatGPT; incredible work that Anthropic does with Claude, and what Google does with Gemini, and what xAI does with Grok. But the important thing to realize, those are four of the 1 ½ million AI models in the world.

AI is not just intelligence that understands English or language, but it's AI that understands genes, proteins, chemicals, the laws of physics. AI that understands quantum. AI that understands physical articulation, otherwise known as robotics. AI I that understands patterns across a long sequence of time – financial services. AI that understands longitudinally across multiple modalities – health care. And so AI has all of these different reaches and domains. We talk about this one area; we just have to be very careful to understand that AI spans basically every form of information across every field of science, across every single industry – 1 ½ million AIs around the world.

On top of that are all the applications. And we never should forget that in the final analysis these AI models are technologies, but technologies are about enabling application, end use. Whether you're in health care, you know, you can be in entertainment, manufacturing, self-driving cars, transportation, each one of these industries have AIs that deeply affect them. And these are the five-layer stack.

NVIDIA is at the lower level, the platform level. The reason why we say that, you know, we're an AI company that works with every single AI company in the world is because we're the platform by which we are able to work with all of these technology companies and all these application companies across all these industries. And so that is a platform that we created.

The mode that people describe – not so much a mode, but basically, the language by which all of these different applications and these different technologies speak to us is an architecture we invented 25 years ago called CUDA. And on top of that CUDA library is a whole bunch of algorithms that we invented over the years, and that is basically NVIDIA's platform. In the end, we don't build self-driving cars, but we work with every single self-driving car company in the world. In the end, we don't discover drugs, but we just have – you know, we work with every single drug discovery company in the world. We are the platform by which they build their things. We're a platform company.

Dr. Hamre: I think half of – I had half-a-dozen young kids come up to me today saying NVIDIA gave them a better gaming experience. (Laughter.) I mean, all your – (laughs) –

Mr. Huang: Before I – before we invented the AI industry, the first industry we created is the modern gaming industry.

Dr. Hamre: Absolutely, yeah.

Mr. Huang: Yeah. You don't know this. I'm very proud of this. NVIDIA is the world's largest gaming platform.

Dr. Hamre: Yeah. And that's – (laughs) –

Mr. Huang: You probably didn't know that. (Laughter.)

Dr. Hamre: That's how most of the kids were talking to me about that today. (Laughter.) I want to see him –

Mr. Huang: Three hundred million active users, a hundred million of them Nintendo Switch. Yeah, NVIDIA's in that.

Dr. Hamre: OK. So let me ask you, you said something recently that was quite provocative. You said that China was winning the AI race, the AI competition. I know that you've got a powerful, you know, competitor in

Huawei, and Huawei has a lot of advantages you don't have. Why don't you describe this competition? Are we really losing?

Mr. Huang: It was a very good headline.

Dr. Hamre: It was a great headline, yeah. (Laughter.)

Mr. Huang: And apparently caught a lot of attention. (Laughter.) As you know with headlines, the disclaimer part, the foundation part, was left out of the headline.

But the way to think about that is – let me just handicap it right now. If you look at AI and go back to the first thing that we said, AI is a five-layer cake. Let's just always simplify. It's not – it's not quite this simplistic, but let's simplify AI into a five-layer cake: energy, chips, infrastructure, models, and applications. OK? And let's handicap it across the – from bottom to top. At the lowest level, energy, China has twice the amount of energy we have as a nation.

Dr. Hamre: I want to ask about that.

Mr. Huang: Twice as much energy as we have as a nation. And they're – our economy's larger than theirs. It makes no sense to me. We also know that one of the most – one of the most important initiatives, one of the most important policies of this administration, and it was the first thing that President Trump said to me when we met, is, listen, we need to reindustrialize America. We need to onshore manufacturing again. We need to make – we need to help America make things again. It's going to create jobs. That part of the economy has been out-shored – you know, offshored and completely gutted in the United States. We need to bring that back. And he needs my help to do so. And so that entire sector of the economy is missing. And, however, without energy how do we build chip plants, computer system plants, and these AI datacenters? We call them AI factories.

We're building simultaneously three different types of factories in the United States – chip factories, supercomputer factories, and AI factories. They all require energy, every single one of them. And so, on the one hand, we want to reindustrialize the United States. How do you do that without energy? And so the fact that we vilified energy for so long – President Trump's sticking his neck out and making – taking it on the chin and helping this – helping the country realize that energy is necessary for our growth, is one of the – really, one of the greatest things he's done, right off the bat. So now, at the energy level, back to that stack, we're, you know, 50 percent. And they're growing straight up. We're kind of flat right now. And so, number one, energy.

Number two, chips. We're generations ahead. We are generations ahead on chips. And I think everybody recognizes that. Number three, infrastructure. If you want to build a datacenter here in the United States, from breaking ground to standing up an AI supercomputer is probably about three years. They can build a hospital in a weekend. That's a real challenge. And so at the infrastructure layer their velocity of building things, because they are builders. Their velocity of building things is extraordinarily high. Now, really quickly, on chips. We're several generations ahead, but don't be complacent. Remember, semiconductors is a manufacturing process. Anybody who thinks China can't manufacture is missing a big idea.

Dr. Hamre: But China discounts energy costs for a chip company by 50 percent.

Mr. Huang: That's right.

Dr. Hamre: They provide free transportation for employees to come out to the factory.

Mr. Huang: That's right.

Dr. Hamre: I mean, you don't – you can't do that. I mean –

Mr. Huang: Our energy cost is more expensive than theirs in the first place.

Dr. Hamre: Absolutely.

Mr. Huang: And then they discount it 50 percent. And so it's probably – we're probably, call it, four to eight times the cost.

Dr. Hamre: So, tell me, how do you feel about this great competition with China? I mean, the government is putting enormous resources underneath their champion. We don't do that in this country. You know, how do you feel about that?

Mr. Huang: Well, before I get there, don't let me not answer that question. I'm dying to answer it. But let me handicap the next two layers. The language – the model layer – the model layer. United States frontier models, our frontier models are unquestionably world class. We are probably, call it, six months ahead. However, out of the 1.4 million models, most of them are open source. China is well ahead – way ahead on open source. Now, the reason why open source is so important is because without open source, startups can't thrive, university researchers can't do research, you can't teach AI, scientists can't use AI. Basically, all of the industry around your economy have no ability to fundamentally advance themselves unless you have open source. Without Linux, where would we be? Without Kubernetes, you know, without PyTorch? All of these different types of technologies that made AI thrive are all open source. They are well ahead of us on open source.

And then the layer above that, applications. If you were to do a poll of their society and ours, and you ask them is AI likely to do more good than harm, they're going to say – in their case 80 percent would say AI will do more good than harm. In our case, it'd be the other way around. And so that tells you something that's very, very important. Socially we need to be careful not to describe AI in these science fiction movie ways of describing AI and causing people so much concern. We want to be concerned, but we also want to be practical. AI is about automation. And that area I think that we need to be careful not to fall behind in the application and the diffusion of AI, because in the end whoever applies the technology first and most wins that industrial revolution.

As you know, electricity was invented in the U.K. But United States applied it faster, more broadly. And as a result, look where we are. And so we have to be a little mindful. And so. anyways, I just handicapped that stack, OK? And I don't think – it's important, when you're looking at AI, not to see it as a holistic thing. It's really not about ChatGPT versus DeepSeek. You have to look at it across all of the stacks and across all of the industries. Does that make sense? It's a little bit more complicated than one simple answer.

Dr. Hamre: But do you feel you have a level playing field up against China putting their resources under Huawei?

Mr. Huang: First of all, America's technology industry, just as our financial services industry, our military, our technology industry, we can all agree are the mightiest in the world. I am part of one of the mightiest industries anyone in history has ever seen. We have – going toe-to-toe against anyone, the American technology industry has nothing to fear. We are mighty. We're fast. We're inventive. We'll take anybody on. However, we can't concede the market to them. As you know, at the moment NVIDIA has been banned from going to China, not to mention China has banned NVIDIA going to China. So we're – I think we're the first company in history that has been banned on both sides. (Laughter.)

And so whoever banned us going to China, them and China agree – (laughter) – that NVIDIA should not go to – now, of course, I'm being a little – I'm being a little cute here. And I'll be a little bit more nuanced here in a second. But at the moment we're simply not competing in China. Now, what's going on? We have conceded, essentially, the second-largest AI market – the second-largest technology market in the world.

China will – it's not – somebody has said to me, well, yeah, OK, well, we're not in China but we'll grows somewhere else. You're not going to replace China. It's just as the world wanting to sell to America, and they want to export to America. If they don't export to America, you're not going to replace the United States. We are singular in the world. We are absolutely singular.

And so in the case of China, we shouldn't concede the entire market to them. They're formidable, but conceding that entire market – we ought to go compete for it. Having said that, we should also acknowledge that Huawei is one of the most formidable technology companies the world has ever seen. They deserve – although they have a lot of support, whatever support they have – they deserve all of the respect that everybody ought to give them. We compete with this company. They're formidable. They're agile. They move incredibly fast. We said, if United States was not in China, China's AI industry would be set back. Absolutely has not happened. As a result, their semiconductor industry has doubled, doubled, doubled. You know, the semiconductor industry in the West around the world, is growing at 20-30 percent per year. Growing 20-30 percent per year compounded, versus doubling every year compounded, doesn't take long to catch up.

Dr. Hamre: But, you know, they're starting on second base, and we're just going up to the batter's box. You know, they've got a real advantage. And that means we need to think about this. Can I ask you, at the G-20 summit Li Qiang, you know, the premier, was there, and he was offering opportunities for countries to be participants with China on AI. We didn't even send a delegation. It doesn't feel like we're in the game.

Mr. Huang: They're smart about technology proliferation. If we – if we use 5G as an example, they realized 5G is technology that's also a platform, because on top of 5G you build all kinds of services on top of it. Well, if you get there first – wherever you get first, if you get there first just as NVIDIA – I was there 25 years first, and so I had – you know, for a long time nobody paid me any never mind, so I had lots and lots of time to build up all these ecosystems and applications and relationships and ecosystems. And I connected all of this stuff together and all these different fields of industry. I had 25 years to do it.

In the case of Huawei with 5G, they were – we were – they were completely – through policy completely isolated, people thought, in China. So they had a billion phone users all to themselves. It gave them the opportunity to grow scale. They exported their technology to all of the country of Belt and Road. And now there's AI Belt and Road, and so they will definitely diffuse the Chinese technology as quickly as possible because they understand that the sooner you get there, the sooner you build the ecosystem on top, the sooner you become a sticky – you become sticky, you become an essential part, a dependent part of that ecosystem.

Dr. Hamre: Tell me about the Chinese ecosystem they're trying to create. Obviously, it is – it's deep and it's robust, and it has a physical as well as a technological and economic dimension. How do you look at that?

Mr. Huang: Take a step back again. Remember, I think it's, like, nine out of the 10 top science and technology schools in the world are now in China. They lead in science and technology in many different fields. This has completely flipped in the last half to a decade. We used to lead most of them; now they lead most of them. They have a large population of highly-qualified students, number one.

Dr. Hamre: Absolutely.

Mr. Huang: Number two, 50 percent of the world's AI researchers are Chinese. Third, 70 percent of last year's AI patents are published by China.

The ecosystem of AI in China is vibrant, rich, incredibly innovative. They work incredibly hard. This is a country with an enormous might. So that is the ecosystem of software developers.

Now, that layer, as I just mentioned, the model and the application layer. All of these scientists, they're sitting at the model and the application layer. And now they're going to take that capability – because the United States is no longer participating in China; we've left China, we evacuated that market, we've conceded that market, and so now they've got to go build their own. So using these AI researchers, all of those incredible computer scientists that the have, their richness of software capability, and they're going to go build their own complete stack. Once they've built that entire complete stack, they'll export it as quickly as you could imagine. And this is the – the world what we will find some day if we don't activate.

Dr. Hamre: We'll be buyers, not sellers.

Mr. Huang: That's right.

Dr. Hamre: Let me ask you now, you're in Washington, D.C. I know you don't look forward to those opportunities, but – (laughter) – we're –

Mr. Huang: It's my only opportunity to wear a suit. (Laughter.)

Dr. Hamre: And a tie. But let me ask, because, you know, we're involved in something I've not seen before in my 45 years here. We've delved into industrial policy. I always thought industrial policy was something that we shouldn't be doing in this country. Now, the Biden administration decided that they would define what they would allow you to sell, and they have this thing that they called diffusion that they were trying to manage.

Now you get the Trump administration, they don't have that but they want a golden chair and they want a percent of the cut, you know, on how you're doing business. Tell me about how you look at this, this industrial policy that we have in Washington.

Mr. Huang: I do agree that industrial policy should intervene when a dramatic action needs to be taken. I also would say that President Trump walked into a – into a situation where dramatic actions needed to be taken.

The first dramatic action that needed to be taken is to reverse the mistakes that have been made in energy growth over the course of the last decade. We are – we have – we have done our country a great disservice. There are no new industries you can grow without energy.

Dr. Hamre: Yeah, electricity.

Mr. Huang: That's right. We need electricity, because otherwise, sure, we could all be in the services industry, and as you know, the services industry only needs calories; but manufacturing industry needs electricity. And so we need energy, number one.

Number two, we do need – if we want to – if we want to fix our social issues, domestic social issues, we have to create prosperity not just for people with Ph.D.s and college degrees; we have to create prosperity for every segment of the economy. And so the largest segment of the economy is manufacturing, and we've offshored that to – for too long, for 20 years. We got to bring that back, and we have the ability to do so.

And this AI industrial revolution, this flashpoint, is precisely when we should do it, because it allows us – it created a company called NVIDIA, made it possible for us to have such a large ecosystem of suppliers. We can encourage them to partner with us. We can encourage Taiwan to partner with us to help us reindustrialize the United States, and they've done so with great support. Taiwan really needs to have some acknowledgement for the incredible effort that they're putting in place to help us reindustrialize the United States. If not for the work that they're doing, the work that – the work that NVIDIA has done in Arizona wouldn't have made the progress it has.

I recently gave a congratulation speech at TSMC in Arizona, and when I looked out into the audience it was two-thirds Taiwanese and one-third American. Arizona is practically – well, the quality of Taiwanese food in Arizona, let me just put it that – (laughter) – the quality of Taiwanese food in Arizona has increased tremendously, OK? (Laughter.) You want to get a bowl of – get a bowl of beef noodle soup, you're going to do just fine. (Laughter.) But all these young – all these young families from Taiwan came to help us stand up our factories, and so we should acknowledge that.

And South Korea helping us stand up our memory manufacturing, we should acknowledge that.

The companies – Foxconn, Wistron, Amkor, SPIL – helping us set up systems manufacturing, they came from Taiwan. Really important. And so, one, if not for the fact.

The second industrial policy is to reindustrialize the United States. That, I think, is a fantastic, fantastic initiative, and I'm all behind that. I was probably the first CEO to jump behind that and take advantage of NVIDIA's capabilities and this flashpoint of AI industrial revolution to help bring all of that supply chain. I committed to my customers, my partners, that we're going to build in this administration within the – within President Trump's term half-a-trillion dollars of AI supercomputers. And so that's the second part: energy growth, reindustrializing the United States.

The third part that I – I think – I think required a fair amount of discussion to help policymakers understand that technology leadership – American technology leadership and American national security goes hand in hand. Our nation's extraordinary technology industry is part of our national security. The fact that we have our technology all over the world that the world relies on to build their industries, their ecosystem, their economies is an advantage for the United States. It's a strength of the United States. It helps keep the United States safe when everybody works with us.

Dr. Hamre: Let me build on that. You know, I think national security, there are two dimensions of national security. And I differentiate small case and large case. Small case national security, small N, small S, I think that's, you know, aircraft carriers and bombers and divisions and training programs. Capital national security, N-S, is the dynamism of your economy, the productivity of your industry, the creativity of your ideas industry, the sense of fairness in your judicial system. You are here. You benefit from that larger case. But you're building that larger national security industry. Tell us how you think about your role on national security.

Mr. Huang: Number one, NVIDIA was birthed in the United States. We are a proud American company. We're inventive. We're vibrant. We're at the center of the single most important industrial revolution in human history. This is an industrial revolution in every single way as important as electricity. We are going to impact every single industry, every single company. Every country will build it. Every company will use it. We export American technology wherever the United States would like us to export the American technology. This is an extraordinary opportunity for us to make a substantial contribution to our national security. We also know that national security and economic security and economic prosperity go hand in hand. The wealthier our nation, the more we can fund the mightiest military on the planet.

And I do believe that it is the case where, because of this new industrial revolution that we've started, we are creating new factories in America. We're creating new jobs in America. And somebody recently told me that we contributed more to economic growth singularly than just about any company in the world today to the American economy. And I believe that that's probably true. And the reason for that is NVIDIA is a multi-hundred-billion-dollar company, supporting multi-hundred-billion-dollar companies, going after trillion dollars of industry. And so the economic prosperity – the technology leadership, unquestionable. The technology – the economic prosperity that we can contribute to, unquestionable.

Now this – the question then becomes, how do we think through the diffusion of, the export of, the proliferation of American technologies and standards. We should, of course, number one, safeguard our national security – the little N, little S – to ensure that adversaries don't have access to sensitive technology or advanced technology that we don't need them to have access to. We should, number two, ensure that American companies, American technology companies, through partnership with us, have the benefit of the best and first. But then after that, after number one and number two, we should also proliferate American technology standards, compete around the world, feel this flywheel of funding our R&D so that we can continue to be the mightiest technology industry in the world, so that we can fund the mightiest military in the world. And all of that, I think, goes hand in hand.

Dr. Hamre: Several times, you know, Chairman Huang, you've talked about energy as being a pacing problem here. You know, when we invented LED lighting, we just lost the demand signal, and half of our – of our electricity grid is merchant supplier. And so they don't buy ahead of need. And so we're now really way behind. And you pointed out that China has built out twice the capacity of electricity than has the United States. How big a constraint do you see that as being for our buildout for this revolution that you're trying to create?

Mr. Huang: Deeply serious. I think at this point we have to use every form of energy we can. I believe we can't rely on the power grid. We ought to build behind the meter. We obviously need power generation systems. There's no question we should try to encourage and try to accelerate nuclear. We need to have energy growth very, very shortly. In the meantime, we're advancing our technology so quickly. No company of our scale has ever introduced new generations every year. And when I say we just ship a new chip every year, people – you know, when people – because there's so many gamers in the world and they've known me for so long – (laughter) – and when they think about what NVIDIA builds, they think it's a module that looks like a gaming graphics card, our GeForce graphics card, and they plug it into their PC.

Well, a GPU for AI centers, AI data centers, that GPU weighs two tons. It has one and a half million parts. It consumes 200,000 watts. It costs $3 million. Every so often, somebody says, you know, these GPUs are being smuggled. I really would love to see it. (Laughter.) Not to mention, you'd have to smuggle enough of them to fill a football field full of these things so that you could run it as an AI data center. And so, anyhow, the technology that we make each year allows us to increase the performance at about the same power by many times.

And let me just pick a number, say five times or 10 times each year. As a result, our energy efficiency improves by five times or 10 times each year. But the problem is this. We're at the beginning of this technology build out. I'm improving the performance by a factor of 10 times each year. But demand is going up by a factor of 10,000, a million times each year. AI is getting more compute intensive. The adoption is going way up. I've got all these exponentials. And so we're going to keep chasing this. We're going to be completely dedicated to advancing the technology as fast as we can. But the bottom line is we need energy.

Dr. Hamre: Yeah. And I – you know, forgive me for interjecting myself. I do think we have to overcome the NIMBY constraints. You know, we're going to have to find some structure of federal preemption so that we can overcome the barriers. That's my comment. That's not your comment. I don't want you to get in trouble for my saying that. (Laughter.) Let me ask you. I mean, last year –

Mr. Huang: Thank you for that. (Laughter.)

Dr. Hamre: Last year the world installed 2 million robots. Half of them were in China, which is really astounding when you think about it. Tell me how robots fit in with AI.

Mr. Huang: You know, let me just give you one example of why it's around the corner. You know, these days you could describe – you could describe in text, and you give it to a video AI, and it generates a video. You guys know this, right? It actually – from words you can generate a video, OK? And let's say the video is Jensen reaches over, picks up a cup. So I take a picture of this, screenshot, give it to the AI. That's the starting condition. And I say, now cause Jensen to reach over and pick up the cup. The AI creates, pixel by pixel, token by token, my arm picking up the cup. And that everybody knows is possible today. You guys have seen it.

Well, the AI can't tell the difference between it manipulating pixels versus it's manipulating a bunch of motors. So the idea that I can tell the robot pick up the cup is clearly just around the corner. We just have to take that AI, which currently sits in the cloud, and we have to put it into, otherwise called embody, it into a physical mechanical system, which is called robotics. So the AI is around the corner. We can see early evidence that the technology must be possible.

Now, China is going to be very, very good at this. For several reasons. They have great demand. They have a natural indigenous demand for more workers. Manufacturing is a core part of what they do. We, by the way, because we're now reindustrializing, reshoring manufacturing, we now again also have significant demand for factory automation. And there's no question we have a shortage of labor. We have – right? We all know that our industries would be – would be larger, more profitable, more vibrant if we just had more workers. And so they have the same challenge. They have a worker shortage coming up, very severe worker shortage coming up, so they have a national strategic imperative to make sure that robotics happens, number one.

Number two, they have the AI technology.

And number three – this is where they have the big advantage – they're really very good at electronics and mechanical intersections, otherwise known as mechatronics. This entire area is – they have the harmony of demand and supply-side capability. Now, many other countries – Japan has surely the demand side. They have the mechatronics. But Japan needs to have much better AI technology. Germany, great demand, extraordinary mechatronics; they need to have great AI technology. The United States? We have – if we reshored industrial, reindustrialize our nation, we will have great demand. We have great software technology. But we really at the moment need to improve our mechanical electronics capability.

Dr. Hamre: Yeah. I mean, you know, using AI to find a better, you know, vegan recipe for foie gras, you know, may be something that my wife will look up, but we need to make this –

Mr. Huang: That would be a miracle indeed, sir.

Dr. Hamre: Oh, it would be good. (Laughter.) But we need to turn this into productive machinery –

Mr. Huang: That's right.

Dr. Hamre: – and the way in which it's going to change the landscape.

Let me ask you, because we're running out of time, you know – (laughs) – I was talking to a friend of mine who's dean of a – of a major research institute. And I asked him, I said, "how is your faculty dealing with AI?" And he said, "Well, you know, the engineering faculty is excited. They really think this is fabulous." He said, the science faculty is really curious and they think it potentially opens up real opportunity. And the humanities faculty thinks it's the end of the world. (Laughter.) So – (laughs) – it is a shorthand for the anxiety that people feel about the dark side of AI. How do you – how do you talk to us about that?

Mr. Huang: Mmm hmm. Let me start from the end. There's no question that everyone's jobs/profession will be affected by AI, because the tasks within our jobs are going to be dramatically enhanced by AI. Some jobs will become obsolete. New jobs are going to be created. And every job will be changed.

So that – let me just – I used two words just now, and it's really important we think about these two words very differently. One is "task." The other one is "job."

Now, it turns out I think it was something like seven, eight years ago a very important AI scientist – maybe THE most important AI scientist – declared the first application for AI will be radiology, because computer vision was the first breakthrough; and that, in fact, entire radiology industry within five years will be completely transformed by AI; and that in five years' time radiologists will all lose their job, and he advises that no one should be a radiologist. That was his advice, and it was taken very seriously.

Now, some five, six, seven, eight years later, every single radiology platform has been completely transformed by AI, 100 percent. Every single radiology platform. The number of radiologists has increased. The question is, why? And the reason for that is because, as it turns out, studying the scans, studying the images, is the task of a radiologist; the goal or the job of a radiologist is to diagnose disease.

This is true for many, many people. People say, I don't need software engineers because apparently coding is going to be automated. I've given AIs to every one of my software engineers and hardware engineers and engineers period. A hundred percent of NVIDIA has AI assistance, AI coders, and they're busier than ever.

And so the question is, what is the task versus what is the job? No different than a financial analyst. The task is mess around with spreadsheets, but the job is to make financial advice. The job is to help a customer. The job is to analyze the market, make a prediction about the market.

And so there's still – the human factor is still quite significant. And I would just tell everyone before you decide that the – that the – that AI is something that you're worried about or scared about, go engage it. Go use it. And even in the humanities, the fact of the matter is without – you know, with AI today my writing has improved. I don't think the quality is; it still writes in my taste and my ways. But my speed of writing has dramatically improved. And so I'm more productive today. I'm still writing the original pieces I still have to write, the original voice I still have to – I still have to create, the original thought still has – but every so often, as you know, when we derive other speeches out of other previous speeches, the concepts are very similar but the content, the delivery, the context is so different. We now can use AI to help us regenerate the first draft. You know, so for me, for the humanities I would just say original thought, original writing, your taste made with human hands are still always going to be valuable.

Dr. Hamre: I went in for an MRI recently and my wife said, make sure you take a picture; I don't think there's a brain up there, but I'd like to see it – (laughter) – to prove there's something.

Mr. Huang: And what did you find out? (Laughter.)

Dr. Hamre: We were – there was – there was nothing, I mean. (Laughter.) She was right and I was wrong. (Laughter.)

We're coming to the end, and you're in Washington. You don't – this isn't always a joyful experience to come to Washington. But share with us what your – you know, your thoughts on how we should think about this remarkable revolution that's appearing in your world. You're leading it. We're going to experience it. We're probably going to try to regulate it; we don't know how to do that. Tell us just a little bit how you think we should be anticipating this and thinking about our future.

Mr. Huang: There are many – of course, we spoke about many different things that Washington has been extraordinarily helpful in already shaping the outcome for our nation. We spoke about industrial policies and how, in fact, a heavy-handed approach was necessary and it was just in time. It is the case that Washington, D.C., is foreign to me, and I've had the benefit of coming here now since the first time I saw you, our first – our first night. And it's unnatural to me.

However, however, what I can tell you is we all want the same thing: We want America to win. We want America to be the greatest nation in the world. We have extraordinary capabilities.

You know, it's hard not to be romantic about this country. My parents had the American Dream. My father always wanted us to grow up in United States, sent us here when I was nine. And they had almost nothing to start a life here. And somehow, through that journey –

Dr. Hamre: It worked out pretty good. (Laughs.)

Mr. Huang: I'm here with the privilege of leading one of the most consequential companies in the history of humanity. And you just can't – you can't write a better story than that. You can't not be romantic about this country. I'm surrounded by extraordinary scientists. I'm surrounded by extraordinary people, all of our technology partners, the ecosystem that we have here. You know, I don't want to be complacent, but it's – it is a miracle that there's no question about it. And I've the benefit of working with every nation in the world. And so I think it's – we can say for certain that we want the same – we want the – we want the same outcome for this nation.

It is important, however, that I come here so that I could at least explain what is AI, it's five layers. I can explain what its impact, how is it going to evolve, and how certain policies, although on appearance might achieve whatever objectives, that the long-term consequences, the unintended consequences, could be quite dire for the United States. And so I have the benefit of at least explaining it from the perspective of technology, and help advocate for technology leadership, so that we could secure our national security. And so I have that benefit. And I'm deeply grateful that the people I get to – get to meet here in Washington, D.C. has always had an open door. And, you know, although this is new for me, and I'm clumsy at it, I can also say that I'm very grateful that Washington has been very open to me.

Dr. Hamre: I know the answer to this question, but I still want to ask it. Are you optimistic about the future?

Mr. Huang: Oh, absolutely. A thousand percent. A thousand percent. The best of days are ahead of us. You know, it is the – I don't have to work. I think I've done – you know – (laughter) –

Dr. Hamre: I think that's true. (Laughter.)

Mr. Huang: And, Ambassador Rudd, you know when he first met me I had – all my hair was black. (Laughter.) And now, you know, if you were to take an image of my brain it could turn out to be the same color as yours. (Laughter.) But nonetheless, this is the one decade I will not miss. I simply won't miss this decade. I don't want to miss these next two decades. We are going to do more for the advancement of science, we're going to do more for the advancement of industry, we are going to do more for this nation in the next two decades than potentially all of it combined in the past. And so I don't want to miss that. This is the best of times.

Dr. Hamre: I totally share that. I think this is going to be the most marvelous period in humanity. And we're looking forward to it. Would you all say thank you with your applause? (Applause.)

Thank you. Thank you very much. Great to have you.

(END.)