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Artificial Intelligence and Big Data Innovations: Navigating the Technology World of the near Future

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ARTIFICIAL INTELLIGENCE AND BIG DATA INNOVATIONS: NAVIGATING THE TECHNOLOGY WORLD OF THE NEAR FUTURE

The following is a transcript of a 2018 Federalist Society panel entitled Technology, Social Media, and Professional Ethics. The panel originally occurred on November 15, 2018 during the National Lawyers Convention in Washington, D.C. The panelists were: Hon. Andrei Iancu, Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent Trademark Office; Ognian “Oggie” Shentov, Of Counsel, Jones Day; Hon. Michelle K. Lee, Former Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office; Shawn D. Hamacher, Assistant General Counsel, Steelcase; and James C. Cooper, Deputy Director for Economic Analysis, Bureau of Consumer Protection, Federal Trade Commission. The moderator was the Honorable David J. Porter of the United States Court of Appeals for the Third Circuit.

[RECORDING BEGINS]

HON. DAVID J. PORTER: Thank you, and thanks everyone for coming. I am Dave Porter, a judge on the United States Court of Appeals for the Third Circuit. The volume of data collected across the globe is of course growing exponentially, and as this massive data becomes more meaningful and contextually relevant, the deployment of artificial intelligence, or “AI,” will continue to increase. AI might be defined as the science that enables machines to do things, like understand language and logic, make decisions, engage in conversations, and recognize images.¹ In this panel, we’ll be considering how the growth of Big Data and AI will affect and be affected by legal issues, such as tort liability, IP ownership and infringement, regulatory activity, ethical questions—like human agency and *mens rea*—privacy, security, competition, and consumer protection.

We have a terrific lineup on this panel. To kick things off, Andrei Iancu will begin. He’s the Under Secretary of Commerce for Intellectual Property and the Director of the U.S. Patent and Trademark Office. Before that, he was Managing Partner of Irell & Manella. I’m just going to give very brief introductions. There’s obviously more bio in the guidebook if you want

¹ Bernard Marr, *The Key Definitions of Artificial Intelligence (AI) That Explain Its Importance*, FORBES (Feb. 14, 2018, 1:27 AM), <https://www.forbes.com/sites/bernardmarr/2018/02/14/the-key-definitions-of-artificial-intelligence-ai-that-explain-its-importance/#1aba89004f5d>.

to see those.

After that, Oggie Shentov will go next. He's Of-Counsel at Jones Day and Vice-Chair of the International Patent Law and Trade Committee of the Intellectual Property Owners Association.

During the Obama administration, from 2014–2017, Michelle Lee had the same job that Andrei has. She was Under Secretary of Commerce for Intellectual Property and Director of the USPTO. Interestingly, she wrote her graduate thesis on artificial intelligence at MIT's AI Laboratory.

Shawn Hamacher is Assistant General Counsel of Steelcase, Inc. in Grand Rapids, Michigan. Steelcase offers architecture, furniture, and technology products and services designed to help people work and learn.

And next to me, Dr. James Cooper is Deputy Director for Economic Analysis in the FTC's Bureau of Consumer Protection. He is on leave from the George Mason University Antonin Scalia School of Law.

So, Director Iancu, would you like to begin?

HON. ANDREI IANCU: Hi. Thank you, Judge Porter. I thought I would stand up over here for my remarks. It's a bit easier. It's an honor to be here with you and all the panelists this morning. I'm especially honored to share this stage with my immediate predecessor, Michelle Lee, who—among many other things—initiated a Big Data Program that not only supports what we currently do at the USPTO, but also serves as the foundation of future AI at the agency.

And thank you to the board, the officers, and staff of The Federalist Society, and especially Dean Reuter, for the invitation to be here today and for organizing this incredible event that takes place every year.

As Judge Porter noted in his introduction, I have the honor of leading the USPTO at this time with nearly 13,000 employees, including some 9,000 examiners—patent and trademarks—who work tirelessly every day to secure the intellectual property rights of inventors and brand owners.²

As you can imagine, the USPTO has vast reserves of scientific data contained in the more than one million patent and trademark applications we receive every year. Indeed, our patent, trademark, and other types of data are among our most important assets. Many depend on our data.³ Whether it's an independent inventor working in her garage or lab to better understand her inventions compared to the existing landscape, or a large multi-national corporation considering whether to invest in developing new technologies to

² See U.S. PAT. & TRADEMARK OFF., FY 2018 PERFORMANCE AND ACCOUNTABILITY REPORT 12 (Nov. 9, 2018), <https://www.uspto.gov/sites/default/files/documents/USPTOFY18PAR.pdf>.

³ See, e.g., *Bulk Data Products*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/learning-and-resources/bulk-data-products> (last visited Feb. 15, 2020).

create new brands or acquire existing patent portfolios, just about everyone uses the USPTO's data to keep up with the pace of innovation and entrepreneurship.

We, too, as an agency at the PTO, are leveraging this invaluable data source so we can more efficiently and effectively fulfill our constitutional mandate “[t]o promote the Progress of Science and useful Arts.”⁴ So, on that front, let me share with you just a few ways we are doing this within the agency.

At the PTO, we have a “Big Data Reservoir” that contains over eight million patent office actions, for example.⁵ This empowers us to harness data to measure work product consistency across our entire patent corps and systematically focus our quality improvement efforts.

For instance, our “Big Data Reservoir” has enabled us to answer fundamental questions, such as how many and what types of rejections under the different statutes are our examiners making and consistently applying throughout the examination corps? How can examiners more effectively use non-patent literature in priority rejections? And what impact has our guidance and training had on examination outcomes? Efforts like these, as well as other patent quality studies, have resulted in reallocating millions of dollars in training expenses to more localized areas for optimal rates of return.

Moreover, by identifying how and what priorities are used by our examiners and comparing that to, for example, the outcomes of AIA trials before the PTAB—our Patent Trial and Appeal Board for those new to the PTO jargon—we can begin to measure and qualify the accuracy of the searches we conduct during examination, as compared to the art an opponent might find during litigation or another dispute after issuance. Enhancing search during the original examination, in particular, is an area that we expect AI could yield tremendous results. Indeed, it's a tool we hope that can help us narrow the gap between the search done during examination and the search done post-issuance.

To that end, we've developed, and we are actively beta testing right now, a new cognitive assistant called “U” or “Unity,” which leverages AI and machine learning in a way that augments our existing next-generation patent tools.⁶ For example, the tool is intended to allow patent examiners, through a single click, to conduct a federated search across patents, publications, non-

⁴ U.S. CONST. art. I, § 8, cl. 8; *Millions of Patents*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/learning-and-resources/ip-motion/millions-patents> (last visited Feb. 15, 2020).

⁵ See, e.g., *Office Action Research Dataset for Patents*, U.S. PAT. & TRADEMARK OFF., <https://www.uspto.gov/learning-and-resources/electronic-data-products/office-action-research-dataset-patents> (last visited Feb. 15, 2020).

⁶ U.S. PAT. & TRADEMARK OFF., PATENT PUBLIC ADVISORY COMM. MEETING, QUARTERLY MEETING TRANSCRIPT 16–17 (Feb. 7, 2019), https://www.uspto.gov/sites/default/files/documents/PPAC_Transcript_20190207.pdf.

patent literature, and images. And through AI and machine learning based algorithms, this would present to the examiner the results in the form of a pre-search report.

We're also exploring semi-automated tools for search query expansion, trained to mine technology-specific synonyms with the help of crowd, or examiner, sourcing. This new capability holds the potential to promote consistency in searching and to more quickly surface prior art that may be located in any of several separate databases. And that's important, because one of the benchmarks of a high-quality patent is whether it can withstand fair challenge down the road. And surfacing the best prior art early helps to increase the likelihood that this will happen. AI can help us do that.

We're also testing new AI tools and technologies, such as robotic processing automation, that could potentially generate smart office action templates that are automatically populated based on the interactions between examiner and attorney, saving our examiners time from some of the more tedious clerical tasks when generating office actions.⁷

And, in an effort to reduce the costs of manually classifying patents, we're exploring the use of AI technology to ensure that we route the right case to the right examiner. This, in turn, enables us to organize our workforce more effectively and, as a result conduct a more effective examination. These are just a few of the many ways we're using Big Data and AI within the institutional walls of the USPTO.

Now, outside our agency, AI has significant implications for the law, the economy, and America's position as the global leader on innovation. Not surprisingly, AI is changing the landscape of intellectual property policy, and, in doing so, it is raising real legal, regulatory, ethical, and moral questions for us to grapple with.

I am sure that other panelists today will address many of these issues in their own remarks, but let me share some IP-related examples. Will the legal concepts of inventor, author, and creator be fundamentally changed by AI? Does the use of copyrighted works to *train* AI systems constitute fair use? How will firms, both large and small, protect AI-related inventions, and how does patent subject matter eligibility impact those strategies? What are the disclosure requirements in a patent for a machine learning algorithm, when the human inventor may not know exactly how the machine will perform a given task after it has learned from training?

Such questions cut across industrial sectors and national boundaries, and many do not have viable answers yet. But how we choose to answer them

⁷ Remarks by Director Iancu at the Artificial Intelligence: Intellectual Property Considerations Event, U.S. PAT. & TRADEMARK OFF. (Jan. 31, 2019), <https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-artificial-intelligence-intellectual-property>.

will have major national economic impact and implications. The good news is that we are working on these issues right now as we speak. And, in fact, these and similar issues will be examined in an all-day conference organized by the USPTO to take place on December 5th at the USPTO. It's called *Artificial Intelligence: Intellectual Property Policy Considerations*. Please attend.

Needless to say, AI has evolved from the obscure to the mainstream, and it's taking the use of computers to a new level, at an awe-inspiring speed. Some have even characterized this fusion of technologies that blur the lines between the physical, digital, and biological spheres as the "Fourth Industrial Revolution."⁸ As with the prior industrial revolutions, these new technologies, which include robotics, autonomous vehicles, and quantum computing—among many others—hold the promise to improve and lengthen lives, generate higher income levels, dramatically increase productivity and efficiency, and—critically important—vastly increase the speed of innovation itself.⁹ But they also pose substantial risks, particularly if the United States is left behind in the innovation race.

Countries around the world are adopting and implementing long-term, comprehensive strategies designed to increase their prominence and leadership in innovation.¹⁰ For example, the "Made in China 2025" initiative is aimed at transforming China into a global leader in strategic industries, such as AI and 5G telephony, that are critical to competitiveness and innovation in the Fourth Industrial Revolution.¹¹

In recent years, there has been dramatic growth in Chinese patent filings in such key technologies as next generation IT, computerized numerical control and robotics, and advanced transportation.¹² When we look at patent applications in the technology areas largely covered by the "Made in China 2025" initiative, we see that filings by Chinese nationals to China's IP office have grown at an annual rate of twenty-four percent between 2006 and 2016.¹³ By comparison, such applications filed by U.S. nationals to the USPTO grew at an annual rate of *only* three percent.¹⁴ Patent filings are not

⁸ See generally KLAUS SCHWAB, *THE FOURTH INDUSTRIAL REVOLUTION* (2016); Bernard Marr, *The 4th Industrial Revolution Is Here - Are You Ready?*, FORBES (Aug. 13, 2018, 12:26 AM), <https://www.forbes.com/sites/bernardmarr/2018/08/13/the-4th-industrial-revolution-is-here-are-you-ready/#fb2b3e4628b2>.

⁹ See SCHWAB *supra*, note 8, at ch. 3.

¹⁰ See, e.g., James McBride & Andrew Chatzky, *Is 'Made in China 2025' a Threat to Global Trade?*, COUNCIL ON FOREIGN REL. (May 13, 2019), <https://www.cfr.org/backgrounder/made-china-2025-threat-global-trade>.

¹¹ *Id.*

¹² Steve Brachmann, *Made in China 2025 Initiative at Center of Growing IP Tensions Between United States and China*, IP WATCHDOG (Apr. 23, 2018), <https://www.ipwatchdog.com/2018/04/23/made-in-china-2025-initiative-ip-tensions/id=95762/>.

¹³ See, e.g., *Patent - Applications for the Top 20 Offices*, WIPO, <https://www3.wipo.int/ipstats/keysrch.htm?keyld=221> (last visited Feb. 15, 2020).

¹⁴ See, e.g., *id.*

fully determinative of innovation, and some have questioned the quality of some Chinese applications, but these statistics are one measure and a potential leading indicator.¹⁵ Other indicators point to similar trends.

And China is not the only innovator in the technologies of the Fourth Industrial Revolution.¹⁶ From the smallest countries, like Singapore, to the largest, like China, many nations around the world have become extremely competitive in the innovative ecosphere.¹⁷

Only by innovating faster, and in key areas, will the United States continue to lead. We must harness our long history of innovation, born of our nation's founding document and perpetuated by our people's innovating spirit since then, and apply the same spirit to this new Fourth Industrial Revolution. As Director of the USPTO, one of my top priorities is making sure that the United States remains the market of choice when it comes to innovation, especially in the emerging technologies of the future, including AI and machine learning technologies.

This administration is committed to protecting and promoting American innovation and entrepreneurship, as symbolized, by the way, by President Trump's recent signing of Patent Number 10 Million.¹⁸ This was only the second time a president signed a patent document since John Quincy Adams, and it evidences the importance of invention and innovation in today's economy and to this administration.¹⁹

So, with that, I want to thank you for the invitation to speak on this important topic, and I very much look forward to continuing the conversation with all of you during the panel discussion. Thank you, all.

OGNIAN SHENTOV: I will be next, then. That's a terrific and wonderful speech by Director Iancu, which I'd like to pick up on some themes that he already outlined. And in particular, I'd like to show a red flag—a warning bell, if you like—that the United States' decades-long leadership position in areas of innovation is—and protection of intellectual property rights is slipping. And it's slipping, in some instances, rapidly, precisely at the wrong time when we are in the midst of a gigantic technological revolution the likes of which we have never seen, at least since the invention of the personal computer in the '70s and the internet in the '90s. The most profound changes are happening technologically in virtually every area of our daily life

¹⁵ Lulu Chen, *China Claims More Patents Than Any Country—Most Are Worthless*, BLOOMBERG (Sept. 26, 2018, 5:00 PM), <https://www.bloomberg.com/news/articles/2018-09-26/china-claims-more-patents-than-any-country-most-are-worthless>.

¹⁶ Priyankar Bhunia, *Only 25 Countries Well-Positioned to Benefit from Industry 4.0 According to New World Economic Forum Report*, EDB SING. (Feb. 13, 2018), <https://www.edb.gov.sg/en/news-and-events/insights/innovation/only-25-countries-well-positioned-to-benefit-from-industry-4-0-a.html>.

¹⁷ *Id.*

¹⁸ *U.S. Patent 10 million*, U.S. PAT. & TRADEMARK OFF., <https://10millionpatents.uspto.gov/patent-10-million.html> (last visited Feb. 15, 2020).

¹⁹ *Id.*

and touch it practically every day.

Obviously, I'm talking about artificial intelligence, about Big Data, and just in passing about blockchain, which I guess we have to leave at this conference for another time, although it is hugely important. So as a definitional matter, artificial intelligence is the theory and development of computer systems that perform tasks that are normally associated with human intelligence.²⁰ And those can be something, like sensing, like visual interpretation.²¹ You can have comprehension, a natural language processing, understanding foreign language and translating, or action, in terms of—the best example being robotics, where a machine feels its environment and wants to navigate and can navigate around it.²²

Big Data is a very closely associated concept. I understand some months ago that, according to IBM, ninety percent of all data generated at any time was created in the past two years.²³ The rate of growth is so tremendous it is overpowering. And Big Data and artificial intelligence are clearly going to determine the winners and losers, if you like, of the coming century. So it's critically important to make sure that the United States retains its leadership position. And there are certain cracks in this thing to which Director Iancu pointed to already.

So, I'd like to start a little bit with the type of problems that I have, and others have identified in the protection of intellectual property. And the major problems can be characterized one way in two categories. One of them is sort of procedural and the other one is systemic, sort of the nature of the beast type of problem. The procedural problem, and what I refer to is probably best illustrated in a Supreme Court decision in *Alice* about four years ago, which attempted to clarify what is patent-eligible subject matter.²⁴

So four years ago, they came up with a two-part test that was supposed to clarify for people—and particularly the examiners in the Patent Office—how to ensure that the particular concept is, in fact, patent eligible and can proceed.²⁵ Well, I'm afraid the Supreme Court in that particular case, and subsequent cases, really kind of failed. The two-part test involves in the first step the determination as to whether a particular idea is directed to patent ineligible concept, such as an abstract idea, law of nature, or something to that

²⁰ *Artificial Intelligence*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/artificial%20intelligence> (last visited Feb. 15, 2020).

²¹ Marr, *supra* note 1.

²² See Alyssa Schroer, *How 19 Companies Are Using Artificial Intelligence to Make Smarter Robots*, BUILTIN (Mar. 10, 2019), <https://builtin.com/artificial-intelligence/robotics-ai-companies>.

²³ Ralph Jacobson, *2.5 Quintillion Bytes of Data Created Every Day. How Does CPG & Retail Manage It?*, IBM (Apr. 24, 2013), <https://www.ibm.com/blogs/insights-on-business/consumer-products/2-5-quintillion-bytes-of-data-created-every-day-how-does-cpg-retail-manage-it/>.

²⁴ See generally *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208 (2014).

²⁵ *Id.*

effect.²⁶ And if so, then it goes to a second step where it is looked into the question of whether there is sufficiently more added in the claim language to make an otherwise non-eligible idea into a patent-eligible idea.²⁷

Unfortunately, it seems like, as a practical matter, the result of the Supreme Court decision at the time is largely uncertainty and confusion, particularly in the area of software where I practice as an attorney. Some software portfolios, as I understand, have dropped in value by eighty percent, primarily because you really don't know whether something is patent eligible or not.²⁸ And even if you get a patent, you may get it invalidated because for a somewhat simple reason: the two-part test checks for something, an abstract idea, that the Supreme Court did not give a definition—and could not give a definition—of what's an abstract idea.²⁹ And, as a result, it's very difficult to apply. Examiners have problems, practitioners have problems, everybody has a problem. So, the problems surrounding patent eligibility are—what we call one-o'-one patent practitioners—are very well-known.

I'd like to finish my portion of the presentation with some aspects of the systemic issues that are relevant to artificial intelligence. And by that, what I mean is artificial intelligence is really—could be looked at something like a black box that, in general, tries to simulate the performance of the human mind on a particular task, or in the case of general artificial intelligence, to simulate a human being or even exceed the human being. Well, the problem in having a black box, and Director Iancu already mentioned this thing, is that it is a black box, and we don't really know exactly how it works. We don't have time to show a slide presentation to see what the typical structure looks like. But it's basically, there's a lot of input, tons of data coming in from one place, it goes through this box, it is massaged, coefficients are being adjusted properly or improperly to come up with a result.³⁰ How exactly that works is something of a mystery, and if you look at it from the perspective of a person who wants to draft a patent application, it's not real clear how you do it.³¹ There are instances in which—for example, there have been suggestions that you do a full-term disclosure, like literally the entire code of the machine.³² Others suggest that in addition to the machine—the artificial intelligence engine—you also have to provide the data because, frankly, the data that is put into the algorithm to train it to perform a

²⁶ *Id.* at 217.

²⁷ *Id.* at 217–18.

²⁸ Lincoln S. Essig & Damien Howard, *Impact of the USPTO Examination Guidelines on Software Patents Post-Alice*, KNOBBE MARTENS (Sept. 2, 2016), <https://www.knobb.com/news/2016/09/impact-uspto-examination-guidelines-software-patents-post-alice#>.

²⁹ *Alice Corp.*, 573 U.S. at 210.

³⁰ Ariel Bleicher, *Demystifying the Black Box that Is AI*, SCI. AM. (Sept. 2, 2016), <https://www.scientificamerican.com/article/demystifying-the-black-box-that-is-ai/>.

³¹ *See id.*

³² *See id.*

particular task could be hugely important.³³ And it, in some cases, may be outcome determinative.

So, the net result of this thing is that we have a situation where written description and enablement requirements—they're part of what the Patent Office does every day—are kind of constrained. It is not exactly clear how people will go about complying with these requirements.

Number two: to have a patentable invention, you need—we deal with concepts of novelty and obviousness.³⁴ Well, obvious to whom? And that's a very interesting question. I understand the European Patent Office, in October, just last month, actually, had a directive in which they defined three categories of person of ordinary skill in the art, only one of which is sort of something that we are familiar with, generally, people who are knowledgeable about concepts and the lingo of artificial intelligence.³⁵ The second category is teams of experts.³⁶ So, one of the biggest applications of artificial intelligence is in medical sciences, and so you need probably a medical expert to figure out if you have lung cancer or that sort of information to put the right medical data into the training algorithm. And then you may need a computer scientist who can figure out what the purpose of this data is and how to make sense of it.

So, we see a diffusion in which it's not even clear who the invention is directed to because the person of ordinary skill may be one person, it may be two persons, and here's the kicker: according to the European Patent Office, the person of ordinary skill in the art could be an artificial intelligence machine.³⁷ So, that's a third option, which is now provided, and it is kind of in the context of should we be giving personal rights to machines and so on.

So, problems with figuring out how to describe and how to enable patent inventions, what is obvious and what is not obvious, and to whom it is obvious—how do you go about enabling it? And the flip side of it is, for example, who infringes? Suppose that you are lucky enough to get yourself a patent. How do you know that someone infringes? And, again, we don't have the slide presentation, but do you see that artificial intelligence systems are generally diffused? They have data owners, you have the engine that runs

³³ *Id.*

³⁴ *Patentability & the Non-Obviousness Requirement*, MCCARTER & ENGLISH, <https://web.archive.org/web/20151222172625/https://www.mccarter.com/Patentability--The-Non-Obviousness-Requirement-05-27-2011/> (last visited Feb. 15, 2020).

³⁵ European Patent Office, *Report from the IP5 Expert Round Table on Artificial Intelligence*, at 2 (Oct. 31, 2018), https://www.fiveipoffices.org/wcm/connect/fiveipoffices/5e2c753c-54ff-4c38-861c-9c7b896b2d44/IP5+roundtable+on+AI_report_22052019.pdf?MOD=AJPERES&CVID=; Mariana Zaichuk et al., *Patenting Artificial Intelligence and Machine Learning Innovations in Europe*, JONES DAY INSIGHTS (Oct. 2018), <https://www.jonesday.com/en/insights/2018/10/patenting-artificial-intelligence-and-machine-lear>.

³⁶ *Id.*; *Case Law of the Boards of Appeal*, EUROPEAN PAT. OFF., https://www.epo.org/law-practice/legal-texts/html/caselaw/2016/e/clr_i_d_8_1_2.htm (last visited Dec. 1, 2019).

³⁷ See European Patent Office, *supra* note 35, at 2; Zaichuk et al., *supra* note 35.

the data, and you have feedback mechanisms, and you have a variety of things. So, who is the infringer, and how do you make sure that they infringe?

Furthermore, because it's the nature of artificial intelligence that it changes over time, well, maybe something that didn't infringe in the past, after a while, after some adjustments are made to the coefficients of the artificial intelligence, becomes infringing. Who is going to determine that? And, of course, another problem in this regard is who's responsible if something goes wrong? At the moment, I think we are dealing with it at a very basic level. It is like if you order something on Amazon and you get something wrong, you kind of know how to deal with it. But what if a robot hits somebody on the street, then who's going to be responsible? The people who created the robot? The people who tested it or put the data in?

I will conclude my opening remarks with, again, it is—there are warning signs the United States is losing some of the innovative leadership that it has had for years. I have data, for example, that in the area of natural language processing, patent applications in China exceed those filed in the United States six times.³⁸ So, you can argue whether these are good or bad applications, but you cannot argue that the focus of the business community is probably slowly drifting away from the United States, which not only provides procedural problems, such as the Supreme Court decisions on patent eligibility, but also makes it difficult to enforce certain actions.

I hope that The Federalist Society is one of the societies that is deeply involved in the solution of societal and legal problems and will take an active role in the resolution of this. Thank you for your attention.

HON. MICHELLE K. LEE: So, I think I'm up next. I'm Michelle Lee. It's a privilege to be here. Thank you to The Federalist Society, and thank you to my co-panelists. It's a privilege to be on the panel with my successor as well. During my comments, I'm going to give you a glimpse into the novel legal issues, to the extent not already addressed by Oggie, as well as the novel ethical issues posed by artificial intelligence.

As with any introduction of any new, disruptive technology, as majorly disruptive as artificial intelligence, it will pose new legal, ethical, policy, regulatory issues that will have to be addressed by all of you in this room, our courts, federal and state legislatures, and the alphabet soup of federal administrative agencies, who are and will increasingly feel the urge to jump in.

Before I discuss some of these novel, legal issues, it's important to understand the difference between artificial intelligence when I was a graduate student at the MIT AI Lab—I'm not going to say how many decades

³⁸ Echo Huang, *China Has Shot Far Ahead of the U.S. on Deep-Learning Patents*, QUARTZ (Mar. 2, 2018), <https://qz.com/1217798/china-has-shot-far-ahead-of-the-us-on-ai-patents/>.

ago—and today. And there are really two main differences. One is that computers are now much faster and much more powerful. Number two is that computers—the memory storage price has plummeted, so that basically everything that you do on a computer, every click you make, every purchase you make online, is now electronically recorded, essentially, forever. You combine those two facts and you have computers now that can pour over vast amounts of data to identify patterns and trends leading to intelligent action. Computers can now *learn*, based upon data provided to it, to take action beyond that which they were explicitly programmed to do by the computer programmer.³⁹ They're drawing inferences.⁴⁰

And why is this important? Well, it's important because it affects the issue of liability, as Oggie mentioned. If there's a harm, do you trace it back to the computer programmer who wrote the lines of code, or the computer programmer's employer? But then what happens if it resulted from the machine learning part of the code, where you have data combined with the explicitly programmed code to arrive at the conclusion? Or what happens if you have combinations of systems with program, code, machine learning, producing output combined with another output from program, code, machine learning, and output. How do you trace liability? And transparency is going to be critical to tracing liability.

Keep in mind that for a tort, there are four elements: duty of care, breach, causation, and harm.⁴¹ And the third element, causation, is based upon proximate cause.⁴² But proximate cause depends heavily on foreseeability.⁴³ But foreseeable by whom and by what? By the computer programmer? By the computer or robot? By the robot's owner? What's reasonable?

These are all new issues that we will have to address on a going forward basis. And Oggie touched upon some of the IP-related issues raised by AI, including obviousness, which I think are all completely valid. Let me just highlight another new novel, legal issue, and that deals with protection.

Who is eligible for protection? The Patent Act—35 U.S.C. § 101, all of you know it well, states that “[w]hoever invents or discovers any new and useful process, machine, [or] manufacture . . . may obtain a patent therefor.”⁴⁴ But it anticipates a human being. And, thankfully, when I was head of the

³⁹ *Machine Learning: The Power and Promise of Computers That Learn by Example*, THE ROYAL SOCIETY 113, <https://royalsociety.org/~media/policy/projects/machine-learning/publications/machine-learning-report.pdf> (last visited Feb. 15, 2020).

⁴⁰ *Id.*

⁴¹ *A Brief Overview of Tort Law*, LAWS, <https://tort.laws.com/tort-law> (last updated Dec. 22, 2019).

⁴² *Id.*

⁴³ Amir Tikriti, *Foreseeability and Proximate Cause in a Personal Injury Case*, ALL LAW, <https://www.alllaw.com/articles/nolo/personal-injury/foreseeability-proximate-cause.html> (last visited Feb. 15, 2020).

⁴⁴ 35 U.S.C. § 101 (2012) (emphasis added).

patent office, no application came in for an invention created by a machine; however, perhaps in Andrei's term, that might happen, and I'll leave it to him to formulate a solution for that one. But, basically, machines in the future will be able to create artistic works and invent as well. So, those will be issues, including infringement—what if a computer, machine, or an algorithm infringes—again, who is liable, and was it foreseeable, and how do you trace liability?

Let me turn to the ethical issues, particularly ethical issues related to a subset of artificial intelligence, which is driverless cars or autonomous vehicles. So, what happens if a self-driving car has to decide between one of two unavoidable harms: to kill a pedestrian, to save the occupant in the driverless car, or vice versa. Human drivers have had to make this decision on occasion, sometimes with split-second notice. Often times, there's no consistency in the decisions from person to person. But how should we program computers to make those decisions? And this is not a theoretical issue because computer programmers today are writing code to identify target objects and to take different actions depending upon its classification of that object. For example, whether the object is stationary or mobile; whether it's a bus or a car; whether it's a hard object or a soft object—a soft object, presumably, being some sort of living thing. So, with the enhancements of machine vision, with facial recognition combined with databases linked to biometric data, like facial features, AI systems will be able to identify gender, age, and other attributes.⁴⁵ So, again, should the driverless car sacrifice the passenger to save the pedestrian?

And what if, instead of a person, it's a cat or a dog? Does it matter whether, if it is a person, it's an elderly person or a young person, male or female? And what if the numbers are different? One person versus a bunch of school children on a bus or crossing a street. It turns out that according to a study conducted by the MIT Media Lab asking some four million people across the globe, answers to these ethical questions are anything but clear-cut.⁴⁶ There seems to be more consensus or stronger consensus of saving young versus old, humans versus pets or animals, more lives versus fewer lives, except, of course, when it's your life or your pet.

In order for us to feel like these driverless cars have made the best decision, these cars will need to make decisions that comport with our values. But who is making these decisions? Engineers? And if so, what, if any, training do they have and what ethical rules are they applying? And if it's the car manufacturers, what incentives do they have to protect the car purchaser or the car occupant as opposed to the pedestrian or the public at large? And

⁴⁵ See Stefan Wojcik & Emma Remy, *The Challenges of Using Machine Learning to Identify Gender in Images*, PEW RES. CTR. (Sept. 5, 2019), <https://www.pewinternet.org/essay/the-challenges-of-using-machine-learning-to-identify-gender-in-images>.

⁴⁶ Edmond Awad et al., *The Moral Machine Experiment*, 563 NATURE 59 (2018).

how should these cars be programmed to comply with whose sets of ethical values?

It turns out that Germany's Federal Ministry of Transport has promulgated the first ethics code related to autonomous vehicles, which states that "any distinction based on personal features (age, gender, physical or mental constitution) is strictly prohibited."⁴⁷ In the U.S. or any other country, to my knowledge, there are no similar such restrictions. The closest that I've found was that the U.S. National Highway Transportation Safety Administration promulgated federal autonomous vehicle policies containing, for now, non-binding and voluntary guidance and asking for input of information.⁴⁸ And, under the first version of this policy published in 2016, NHTSA sought input on ethical issues, specifically asking automotive manufacturers how vehicles are currently programmed to address conflict dilemmas on the road.⁴⁹

Now, under the second version, which was published in 2017, NHTSA removed the inquiry on the ethical issues, which I think is the proper approach, given the nascency of the technology and the products as well, given the proper role of administrative agencies, such regulations, although well-intentioned, stifle innovation, impede the role of the free-market forces to guide and define optimal products and services, waste resources, and quite frankly and importantly, do not reflect the values of the public at large.⁵⁰ As a former head of a governmental agency, I think these agencies are woefully ill-equipped to come up with these rules without broad and deep input from a multitude of stakeholders. And if rules are promulgated, they should be enacted by the legislative bodies rather than administrative agencies to really capture the full sentiment, by elective officials, of all of us and all of our values.

Now, let me pivot to the criminal side before I end. On the criminal side, there is an interesting case—*Loomis v. Wisconsin*.⁵¹ Some of you may have followed it because there was a petition filed at the Supreme Court.⁵² And in that case, the defendant's jail sentence had been determined in part by considering the results of a software algorithm which produced a recidivism

⁴⁷ *Ethics Commission: Automated and Connected Driving*, FED. MINISTRY OF TRANSPORT & DIGITAL INFRASTRUCTURE 11 (June 2017), https://www.bmvi.de/SharedDocs/EN/publications/report-ethics-commission.pdf?__blob=publicationFile.

⁴⁸ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., AUTOMATED DRIVING SYSTEMS 2.0: A VISION FOR SAFETY ii (Sept. 2017), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf.

⁴⁹ NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., FEDERAL AUTOMATED VEHICLES POLICY: ACCELERATING THE NEXT REVOLUTION IN ROADWAY 26 (Sept. 2016), <https://www.transportation.gov/sites/dot.gov/files/docs/AV%20policy%20guidance%20PDF.pdf>.

⁵⁰ See NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., *supra* note 48, at iv.

⁵¹ See generally *State v. Loomis*, 881 N.W.2d 749 (Wis. App. Ct. 2016).

⁵² *Id.*, cert. denied, 137 S. Ct. 2290 (2017).

risk score.⁵³ The algorithm predicted that the defendant posed a high risk of recidivism, but the defendant was not permitted to determine how the algorithm arrived at the conclusion due to concerns about confidential proprietary intellectual property.⁵⁴ The defendant argued that the Court's consideration of the AI generated risk assessment violated his due process because the use of the risk assessment was used without his ability to challenge its validity, and also because the assessment took into account his gender.⁵⁵

The Supreme Court ultimately denied the request for review, and so, the sentence stood.⁵⁶ But, this case raises interesting questions about the use of AI algorithms in deciding, or, at a minimum, informing whether and how long people are sentenced or put on probation. And keep in mind that AI algorithms may also reflect biases of the programmers as well as the data fed to it.

From an ethical perspective, how do we feel about an AI system influencing, or even making, decisions to curtail our liberty and possibly even our life? Although I am an IP lawyer, I believe that defendants should have the right to know how these algorithms work to determine how these risk scores are computed so that they may have the opportunity to rebut it with facts if necessary. And, machines do not do well with the notion of judicial discretion. But maybe that's the idea—to ensure greater consistency and less bias. I will say that, while judges may be subject to bias, computer AI systems can and should do better in terms of accuracy, fairness, accountability, and transparency; otherwise, why have them? So, let me end by quoting a famous proverb: “to err is human.” But for a computer, systematically programmed, broadly, powerfully, and efficiently propagated across the country, across the world, to err is unacceptable. Thank you.

SHAWN D. HAMACHER: So, I think that's my cue. Good afternoon. It's an honor to be with you and thank you, also, to the co-panelists. Now, you may have glanced at your list of speakers and wondered what's so remarkable about a 100-year-old furniture manufacturer, a company that's largely known for manufacturing desks, chairs, and architectural office furniture/office products, when the topic of discussion today is artificial intelligence and Big Data innovation. You probably don't feel like you're navigating the technology world of the future when sitting in your elegant, new Gesture chair behind a beautifully designed desk, unless, perhaps, if the desk is height adjustable.⁵⁷ That's technology, right? I'd like to take a few

⁵³ *Id.* at 754.

⁵⁴ *Id.* at 755.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Gesture*, STEELCASE, <https://www.steelcase.com/products/office-chairs/gesture/> (last visited Feb. 15, 2020).

minutes, though, to highlight Steelcase's digital transformation strategy, bringing AI and machine learning into the workplace environment.

The reality is that digital transformation is happening everywhere and affecting everybody. AI and access to smart data will, just like everything else, transform the future of work, workers, and the workplace. Steelcase's transformation involves the integration of digital and emerging technologies to bring systems of intelligence to our customers, which empower their employees, help them engage their own customers, optimize their operations, and transform their own products and services.⁵⁸

I tuned in the last couple of days to the Federal Trade Commission's seventh session of its Hearings Initiative with the two-day hearing taking place at Howard University Law School here in D.C., the focus being on algorithms, artificial intelligence, and predictive analytics.⁵⁹ It's fascinating to listen to major industry players, especially in technology, healthcare, and financial services, describing the different challenges they confront with their own uses of AI and Big Data, where autonomous decisions affect basic individual rights and/or consumer safety.

In February of this year, the Subcommittee on Information Technology of the House Committee on Oversight and Government Reform also held a series of hearings on AI.⁶⁰ Leading experts from academia, industry, and government gave their reports.⁶¹ Several points became evident. First, AI is an immature technology.⁶² Its abilities in many areas are still relatively new.⁶³ Second, the workforce is affected by AI.⁶⁴ Whether the effect is overall positive, negative, or neutral remains to be seen. Third, AI requires massive amounts of data, which may encroach upon privacy or perpetuate bias, even when using data for good purposes.⁶⁵ And, finally, AI has the potential to disrupt every sector of society in both anticipated and unanticipated ways.⁶⁶

Now, chief among the Subcommittee's concerns, of course, are policy questions. It's dialing up the appropriate regulatory approach to AI to solve for the tensions between technological advancement and the legal and

⁵⁸ See *The Race to Digitize*, STEELCASE, <https://www.steelcase.com/research/articles/topics/technology/race-digitize/> (last visited Feb. 15, 2020).

⁵⁹ *FTC Announces Agenda for the Seventh Session of Its Hearings on Competition and Consumer Protection in the 21st Century; Session at Howard University to Focus on Algorithms, Artificial Intelligence, and Predictive Analytics*, FED. TRADE COMM'N (Feb. 15, 2019) <https://www.ftc.gov/policy/public-comments/2019/02/15/comment-ftc-2018-0101-d-0011>.

⁶⁰ *Subcommittee on Information Technology Hearing: "Game Changers: Artificial Intelligence Part I,"* COMM. OVERSIGHT & REFORM (Feb. 14, 2018, 2:00 PM), <https://oversight.house.gov/legislation/hearings/subcommittee-on-information-technology-hearing-game-changers-artificial>.

⁶¹ *Id.*

⁶² *Id.* (Oren Etzioni testifying about how primitive AI is).

⁶³ See *id.*

⁶⁴ See, e.g., *id.*

⁶⁵ *Id.*

⁶⁶ See *id.*

ethical considerations involved. It's examining whether the risks fall within any existing regulatory frameworks, and if so, whether those existing frameworks can adequately address the risks. Where a risk falls outside of an existing framework, an approach should consider whether modifications or additions to the existing framework are needed or better account for the addition of AI.

So, what is AI anyway? Oggie gave his definition. You'll hear it defined many different ways because it's essentially a computational technology that works and reacts in human-like ways.⁶⁷ The idea is to train AI algorithms on vast amounts of collected data and to keep learning as they affect decisions going forward. Machine learning is one subfield of AI, where machines take data they learn for themselves.⁶⁸ Where AI involves hard coding software, the specific instructions for a system to carry out machine learning allows a system to learn and recognize patterns on its own and make its own predictions.⁶⁹ This is often called predictive analytics or predictive modeling.⁷⁰

Fast forward, and let's look at how AI, smart data, and the gig economy will transform the future of work. In another ten years, the integration of AI, virtual reality, augmented reality, and human analytics will make your current office look as quaint and unrecognizable to you as the rotary phone. In the future, you may walk about an office full of computers. But these computers will look and feel profoundly different. Virtual reality headsets will create immersive holographic experiences. While less isolating, augmented reality glasses will layer virtual information atop the physical plane. Rooms and furnishings will feel different—more intuitive and designed to accommodate diverse networks of people who come together to solve difficult problems.

Perhaps the most noticeable change will be that the lines between technology and space will blur. Embedded with smart sensors and speech recognition software, your workplace will take care of much of the administrative day-to-day—transcribing meeting notes, scheduling conference calls, responding to your routine emails, and generally serving as a dutiful member of your team. Spaces designed for your well-being will accommodate the very work styles, privacy expectations, and personality types of the teams that occupy them.

We are already seeing today's companies adapting spaces to align

⁶⁷ *Artificial Intelligence*, *supra* note 20.

⁶⁸ See *Machine Learning*, GEEKSFORGEEKS, <https://www.geeksforgeeks.org/machine-learning/> (last visited Feb. 15, 2020).

⁶⁹ See *id.*

⁷⁰ Katrina Wakefield, *Predictive Analytics and Machine Learning*, SAS, https://www.sas.com/en_gb/insights/articles/analytics/a-guide-to-predictive-analytics-and-machine-learning.html (last visited Feb. 15, 2020).

with human needs and constantly changing workplace demands. Tomorrow, organizations will be able to manage buildings, desks, and computers as never before. Supporting employees by giving them greater control over their environments, the data and AI brokered to orchestrate these changes will teach machines to anticipate and predict desired future states—to go beyond sensing and responsiveness, to be able to speak to us intimately, assist with our projects and tasks, and radically improve our workplace fitness and augment performance.

For illustration, imagine an application that relies on AI and smart data to report room occupancy, especially in real time. Think of your conference rooms and other meeting spaces—how valuable it would be to enter a building or an area and know what spaces are available by looking at a digital floorplate. To do this autonomously requires training machine learning algorithms to determine, based on sensor inputs, whether a person is in the room. The AI becomes better at guessing correctly with the more sensor data you feed it. Confidence levels are important here as you're asking Outlook, for example, to release a room reservation so someone else may use the space. It's also important to be able to differentiate people from other objects in the room, so training machine learning algorithms, or machine vision, to detect uniquely human features can improve accuracy. Once the AI can detect humans, then it can count how many people are present and so on. So, you see how this goes, and it builds on itself.

Other applications involve the use of sensor data to empower better human decisions affecting space allocation and furnishings in the workplace. These would be referred to as human-in-the-loop type applications, where the decision-making is not totally autonomous. Sensor data about how frequently meeting spaces with certain attributes are used in comparison to others gets reported out through a web-based dashboard tool. Measuring space performance allows a facilities manager, then, to make more informed decisions about their capital spent to better meet the specific needs of employees as expressed through their own interactions with the space. It's collecting and making sense of high volumes of unstructured data about how space is used in the workplace.

Now, transparency is trust when entering this realm. AI systems raise questions about permissions and data ownership, privacy, and security. Privacy engineering and risk management jump to the forefront. Anonymization techniques are used to design around employee perceptions of individual monitoring or workplace surveillance. Other organizational and technical measures must be put in place to secure data. Cyberattacks are more likely to exploit vulnerabilities in AI systems. How far must one go with systems hardening and penetration testing in view of all the likely threat vectors in order to satisfy a commercially reasonable standard? At a

minimum, a widely agreed upon standard for measuring the safety and security of AI products and applications should precede any new regulations. The National Institute of Standards and Technology, or “NIST,” seems situated to be a key player in developing these standards, and I see a lot of government deferment to the NIST initiatives.⁷¹ However this shakes out, AI solutions require accountability, which means they should be able to demonstrate that they have the right processes, policies, and resources in place to minimize potential risks and adverse impacts to the individual and the public at large. Thank you.

JAMES C. COOPER: Thank you. I want to thank The Federalist Society for inviting me, and it is a great honor to be on such an august panel. I’m, as you heard in the introductory remarks, I’m from the Federal Trade Commission, and we’re a unique agency in the sense that we have both a consumer protection and a competition commission. In fact, the FTC, as probably many of you know, has been really the leading privacy and data security enforcer at the federal level since the dawn of the internet age, really the late 1990s until today.⁷² So, in that vein, I want to talk about some of the privacy and competition issues that Big Data raises. Before I do that, let me give my disclaimer that these remarks are mine and shouldn’t be attributed to the Federal Trade Commission or any individual commissioner. In fact, much of what I want to talk about today is work that I’d developed while I was actually at Scalia Law School—I’m currently on leave at the FTC.

So, with those caveats out of the way, let me first talk a little bit about privacy and Big Data. And Michelle touched on this. The benefit of Big Data is the three to five V’s. We have these gigantic data sets—volume, veracity, variety, and some other V’s that are escaping me right now.⁷³ But the idea is that you can gain with these giant data sets—you have a lot of statistical power to tease out unknown associations or correlations. And, that is really the promise of Big Data. Probably everyone has heard about Google Flu Trends.⁷⁴ That’s an example. There’ve been methods that have been used to try to predict potential bad outcomes in a neonatal ICU setting.⁷⁵ And then, there’s the more mundane—Netflix recommendations and Amazon recommendations.⁷⁶ But those are all applications of Big Data and

⁷¹ See generally NAT’L INST. OF STANDARDS AND TECH., <https://www.nist.gov/> (last visited Feb. 15, 2020).

⁷² *Protecting Consumer Privacy and Security*, FED. TRADE COMM’N, <https://www.ftc.gov/news-events/media-resources/protecting-consumer-privacy-security> (last visited Feb. 15, 2020).

⁷³ *The Five V’s of Big Data*, BBVA (May 8, 2017), <https://www.bbva.com/en/five-vs-big-data/>.

⁷⁴ *Google Flu Trends*, GOOGLE, <https://www.google.org/flutrends/about/> (last visited Feb. 15, 2020).

⁷⁵ Wullianallur Raghupathi & Viju Raghupathi, *Big Data Analytics in Healthcare: Promise and Potential*, 2 HEALTH INF. SCI. SYST. 1, 3–4 (2014), <https://link.springer.com/content/pdf/10.1186%2F2047-2501-2-3.pdf>.

⁷⁶ Shabana Arora, *Recommendation Engines: How Amazon and Netflix are Winning the Personalization Battle*, MARTECH ADVISOR (June 28, 2016, 5:40 PM), <https://www.martechadvisor.com/articles/customer-experience-2/recommendation-engines-how-amazon-and-netflix-are-winning-the-personalization-battle/>.

algorithms.

So, this same promise, though, of Big Data, which we've heard a lot about on the panel so far, also is the same—you know, there are two sides to this coin. The other side gives rise to privacy concerns. The worry is that these large data sets coupled with powerful algorithms, machine learning, are going to be able to suss out private characteristics about us that we don't want out there, that we want to keep private.

Perhaps what I call the poster child for Big Data gone bad, is the Target example.⁷⁷ Perhaps some of you are aware of that, that several years ago, Target—a father began seeing ads sent to his teenage daughter for cribs or prenatal vitamins, things like that, coupons, and he was offended.⁷⁸ And so he went into Target and said, “How dare you send my daughter these things!”⁷⁹ And they said, “Well, she was on our list because we thought she was pregnant.” Turned out, she actually was pregnant.⁸⁰ And what had apparently happened is that some clever analytics guy at Target said, “Well, we've got a baby shower registry, and so we know—we have a set here, and then, on the other side, we can see what these people purchase in their daily lives.”⁸¹ “So, we know a set of pregnant people and what they purchase, so we can run that through some analytics and come out with a prediction and then, apply that to our larger population.”⁸² And that's what they had done here. So Target is often held up as the poster child, again, for, as I said, Big Data gone bad—a reason we need to really clamp down.

And, while I think there are some legitimate fears, I want to highlight a couple of reasons why I think we should proceed cautiously before we look at examples like that and say, hey, we have to stop.

First, I think it's important to distinguish between two types of harms that can arise from a Big Data scenario, like we just talked about. So, imagine an algorithm that crunches a variety of data, whether it's purchasing habits or Fitbit feed or social media, for whatever reason, to predict diabetes risk. Okay? And there're two possible distinct harms that could be suffered by someone who's been predicted, say, accurately so, to actually be a diabetic. So, first, that person may feel there may be stigma, there may be some sort of embarrassment because this is a sensitive, personal, health condition. We all have different thresholds for what we are okay with being public or private, and that may very well be something that this person would want to keep

⁷⁷ Kashmir Hill, *How Target Figured Out a Teen Girl Was Pregnant Before Her Father Did*, FORBES (Feb. 16, 2012, 11:02 AM), <https://www.forbes.com/sites/kashmirhill/2012/02/16/how-target-figured-out-a-teen-girl-was-pregnant-before-her-father-did/#1b7609576668>.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

private—that they have a medical condition. In fact, we have a law called HIPAA that is all about that, and one of other medical privacy laws at the state level.⁸³ This type of intangible privacy harm is really no different than the type of intangible privacy harm that is covered by the normal privacy torts—intrusion into seclusion, publication of private facts, the Brandeisian torts.

But, there's a second type of harm, and this is, I think, the one that often gets more of the attention, but I don't necessarily categorize this as a privacy harm. The second—that this person who's been accurately predicted to have diabetes may end up with, say, higher insurance rates. Somehow this data ends up in their insurance. So, is this a harm to that consumer? Yes, it is. But, is it a privacy harm? Is it something that falls under the ambit of privacy? Well, I would say that they're subtly different, and it leads to important policy conclusions, I believe. So, what's happened here is a third party has taken some action based on accurate information. Now this, unfortunately, for the person who's been found out to have diabetes and now, perhaps, pays a higher health insurance rate—he's been on the bad side of what we call separating equilibrium. Before that, we had pooling—non-diabetics and diabetics together pay one rate. Now, I can more accurately figure out who's diabetic and give them a higher rate. Bad news for that person.

But, there's a flip side, and the flip side is what we have to be cognizant of. The flip side is the people without diabetes now pay a lower rate. The other part of that is that, to the extent that this ameliorates what are called adverse selection problems, then you actually make the pie bigger. You've actually—to the extent that people are kept from a market because they can't accurately signal their true type, that they're actually a good type—that's called adverse selection. And that leads to the "Lemons Market" to the extent anyone's heard of that before—George Akerlof, Nobel Laureate.⁸⁴ The notion that once you can get this separation, now you can draw more people into the market because prices go down, demand curves slope down, and you increase social welfare.

So, to the extent that Big Data allows this type of separation by sussing out previously hidden characteristics, there's winners and there's losers, and they offset. But, it can also make the pie bigger. I say this as an economist—the pie, the social welfare. It actually can increase social welfare. So, to the extent that we think that these are harms, we have to realize that, on

⁸³ See Health Insurance Portability and Accountability Act (HIPAA) of 1996, 42 U.S.C. § 1320d (2012); *Your Rights Under HIPAA*, U.S. DEP'T OF HEALTH & HUMAN SERVS., <https://www.hhs.gov/hipaa/for-individuals/guidance-materials-for-consumers/index.html> (last visited Feb. 15, 2020).

⁸⁴ See generally George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. OF ECON. 488 (1970).

the other side, there's a gain.

There's an interesting paper a couple years ago by Liran Einav, he's an economist at Stanford, along with various co-authors, that, actually two different versions looking at this data set—one published in *RAND*, one published in the *American Economic Review*—look at a situation where you have a group of subprime lenders—or I should say a used car dealer that deals with a subprime market.⁸⁵ So, these are very risky borrowers—we're almost at the usury cap. There are high default rates. They couldn't really distinguish between relative less and more risky within this pool—everyone who applied for a loan essentially looked the same on paper. Very similar zip codes, same income, everything. It was impossible to tell the good credit risks from the bad credit risks within that pool. They were pooled together. Once they got the ability to create credit scoring, which is just another type of very early Big Data they were then able to determine who in this pool of relatively high credit risks were actually, compared to the rest of the population, but within their population was actually very good credit risks. They just maybe had transitory bad luck. But, then there are the deadbeats.

So, what happens? What happened is the good—the more people came into the market because they could credibly signal that they were actually good credit risks, even though they looked like bad credit risks. Bad credit risks no longer got loans. So, people got better cars, more money, and the car dealer made more profit. This is the idea of the pie getting larger—more people were drawn into the market when you can get this type of separation.

So, let me say that just because this is, perhaps, the economics of the situation is not to say that we shouldn't be concerned about the person who's on the bad side of this separation, but I think it's important that we don't deal with this through privacy laws. These really should be dealt with through non-discrimination laws. They're important areas. And, I think the good news is that we have, already on the books, a lot of laws that deal with this. The FTC, for instance, enforces the Equal Credit Opportunity Act, which prohibits basing credit on a whole bunch of protected characteristics, such as race, gender, religion, age.⁸⁶ Can't do that. There're also fair housing laws.⁸⁷ There are employment laws.⁸⁸ There's GINA, the Genetic Information

⁸⁵ See generally Liran Einav et al., *The Impact of Credit Scoring on Consumer Lending*, 44 *RAND J. ECON.* 249 (2013); William Adams et al., *Liquidity Constraints and Imperfect Information in Subprime Lending*, 99 *AM. ECON. REV.* 49 (2009).

⁸⁶ 15 U.S.C. §§ 1691–1691f (2012); *Equal Opportunity Act*, FED. TRADE COMM'N, <https://www.ftc.gov/enforcement/statutes/equal-credit-opportunity-act> (last visited Feb. 15, 2020).

⁸⁷ 42 U.S.C. §§ 3601–3619 (2012); *Housing Discrimination Under the Fair Housing Act*, U.S. DEP'T OF HOUS. & URBAN DEV., https://www.hud.gov/program_offices/fair_housing_equal_opp/fair_housing_act_overview (last visited Feb. 15, 2020).

⁸⁸ See *Summary of the Major Laws of the Department of Labor*, U.S. DEP'T OF LABOR, <https://www.dol.gov/general/aboutdol/majorlaws> (last visited Feb. 15, 2020).

Nondiscrimination Act, which limits the use of genetic information for insurance or employment.⁸⁹ Those could actually be very valuable when we talk about separation. But we, again, as a society, say there are limits. We can maybe suss this out, maybe we can get some efficiency, make the pie bigger, but we're okay limiting the ability to use genetic information to make decisions. Again, these are cuts. But, these aren't necessarily privacy issues. I think they're more in the domain of—should be dealt with more in the domain of non-discrimination.

Finally, the FCRA, the Fair Credit Reporting Act—really, the first Big Data statute that limits who can use credit reports.⁹⁰ It limits how you can use credit reports, and it provides transparency.⁹¹ It gives consumers the ability to look at and correct their credit reporting and get notified with adverse actions—why didn't I get this loan?⁹² So, those sorts of things.

We have a lot of things on the books. We may not have a specific privacy law like the GDPR or the upcoming California law, but what I'm really trying to say here is I don't think the U.S. should necessarily be pilloried for that because we have sectoral laws that are really risk-based. And, we look at areas where we say this kind of discrimination on this sort of private information, even if we can figure it out, even if it creates efficiencies, we don't want it. It may not be written into a grand federal privacy law, but, nonetheless, these protections are there, and if we feel that there're gaps, it's an issue for Congress, and we can think about that. When I say "we," I don't mean the Federal Trade Commission. I want to make that clear. I'm speaking only for myself.

So, second—we're still thinking about Big Data and privacy—another thing I want to be hesitant, and you see this in some of the calls for regulation in this area, is the notion of data minimization, meaning when you're going out and collecting data, just take what you need. Don't take anything else at all. And, I understand that and that makes sense from a privacy perspective, right? But I think that the restrictions—we come up with restrictions, they probably should be on the use of the data rather than on the collection side. It's not to say that there are some data that we don't want to limit or make harder to collect. We already do that—again, healthcare. We do that with children. We already have protections on the books, and if we want more protections, that's fine. But, I think what we have to be careful with, because of all the promise of Big Data and AI that's out there, is we don't know what these data may be able to do. We don't know what could

⁸⁹ See generally Genetic Information Nondiscrimination Act (GINA), Pub. L. No. 110-233, 122 Stat. 881 (codified in scattered sections of 26, 29, and 42 U.S.C. (2008)); *Genetic Information Nondiscrimination Act*, GINAHELP (June 2010), <http://www.ginahelp.org/GINAhelp.pdf>.

⁹⁰ See generally 15 U.S.C. § 1681 (2012).

⁹¹ See *id.* § 1681(b).

⁹² See *id.* § 1681(d).

be left on the cutting room floor if we don't collect it. So, I think it's not to say that there shouldn't be reasonable limits on collection, but I don't think that data minimization is necessarily the way to do this. I think there's probably a smarter balancing of collection and use.

And let me move—a final thing I'll just quickly say on privacy, and Michelle touched on this, on some of these really interesting ethical issues that when I go back across the river as a law professor, these will make great law final exam questions. But, I think that there are certainly very legitimate concerns about algorithmic bias. The idea of what are the training sets. You, perhaps, have heard the story about Amazon in the news. Amazon used an algorithm to help hiring decisions, and it was trained on the set of Amazon employees, which were mostly white males.⁹³ And so, they ended up picking out white males, and then they realized—someone realized, like, hey there's something wrong here.⁹⁴ We're not getting the diversity that we thought we would. And the reason is the training set.⁹⁵ And that may be an apocryphal story. It was in the media.⁹⁶ It doesn't necessarily mean it's true, but it's one of those, kind of like the Target example, that's held up there.

So, I think that these are legitimate questions, but I do think we have to be careful when we think in this area not to commit the Nirvana fallacy, that we have to look at what is the benchmark. Often, algorithms are more accurate and have less bias than the human counterparts. And I, again, will return to credit. Prior to credit scoring coming along, how were loans given out? Loans were given out by people who would look at you and look at some of your documents. But there're biases, conscious or unconscious, built into all of us.

What we saw empirically is that once credit scoring came along and it became anonymous, it was done based on a number—now, it's not to say that there's not discrimination in lending. I'm not saying it's been purged, but the data are pretty convincing that the biggest gainers from credit scoring were women, minorities, and those consumers from lower and middle income groups. That's who gained. People who previously were judged not credit worthy by humans, now you have a score. The credit explosion that we saw in the '70s and '80s from credit reporting is mostly not from the white college-educated male who could always get the loan; it's from the people who couldn't previously prove that they could get the loan. That's where we see

⁹³ Isobel Asher Hamilton, *Amazon Built an AI Tool to Hire People but Had to Shut It Down Because It Was Discriminating Against Women*, BUS. INSIDER (Oct. 10, 2018, 5:47 AM), <https://www.businessinsider.com/amazon-built-ai-to-hire-people-discriminated-against-women-2018-10>.

⁹⁴ See, e.g., Rachel Goodman, *Why Amazon's Automated Hiring Tool Discriminated Against Women*, ACLU (Oct. 12, 2018), <https://www.aclu.org/blog/womens-rights/womens-rights-workplace/why-amazon-s-automated-hiring-tool-discriminated-against>.

⁹⁵ See, e.g., *id.*; Hamilton, *supra* note 93.

⁹⁶ See generally Goodman, *supra* note 94; Hamilton, *supra* note 93.

it.

I want to mention, just quickly, I said I'd talk about competition. I do want to just make a couple quick points on competition that Big Data is often looked at—giant data sets are looked at as a barrier to competition. I think, and you see this, perhaps, because some of the largest tech platforms who live on data, they seem to have dominant positions. It seems to lead to the conclusion that, well, these giant data sets are one of the problems. We need to do something about that. Often, because of the notion of network effects, which leads to increasing returns to scale, which may mean we end up with one dominant player in, say, the social media or search industries, to pull two out of the air. But I also think we need to be careful by merely focusing on large data sets as the key to dominance. I would say that a large data set is definitely not a sufficient condition to succeed and probably not even necessary. Look at the startups like—you may have heard of them—Uber, Airbnb, Instagram, Snapchat, just come to mind. None of those came with giant data sets. But yet, they rose to create industries—sharing industries—and dominate the sharing industries. And, at the same time, to pose serious challenges in social media.

The FTC is holding hearings on the competition and consumer protection in the 21st century, and we had some on Big Data last week. And, one of the themes that came out of that is that the key, the Big Data in and of itself, the giant data sets of the billion observations are useless unless you have a smart, clever team who knows how to ask the right questions. And that's probably the key to being a competitor, not necessarily sitting on a billion data points because if you don't know what to do with them—in fact, how Hal Varian, the Chief Economist of Google, had written a couple years ago in an article that Google, when they were doing their A/B testing or pulling to experiment, they pull a sample of less than one percent of their data.⁹⁷ They have tons of data; they don't need all of it to figure out how to hone their algorithms.

The final thing I'll say, on the competition side, when it comes to Big Data is we just want to be careful not to punish success, and from a static—we have to be careful about dynamic incentives from a static view. It's really easy to look at the large, entrenched social media or search platforms and say, "We have a problem and, they all have data. We need to do something about it. Perhaps make them share their data sets." That's been out there as a possible solution. But just like intellectual property—that's really the only thing I'll say about intellectual property here on this panel because I'm already getting out of my lane a little bit—we give exclusivity to create incentives. And this is a big incentive to produce dynamically. And this is a

⁹⁷ Hal R. Varian, *Big Data: New Tricks for Econometrics*, 28 J. ECON. PERSP. 3, 4 (2014), <https://pubs.aeaweb.org/doi/pdf/10.1257/jep.28.2.3>.

theme that runs through all of antitrust law, that you don't punish the firm after you've encouraged them to compete and win. Now they've won, and now you're going to punish them. Well, what sort of *ex ante* incentive does that provide to the marketplace? I think we have to be very cognizant of that as well.

So, just to sum up, we've seen throughout this panel that Big Data raises some really important issues. And this is why at the FTC we're holding a series of hearings—we just finished up with two days of AI hearings yesterday. Last week, we did three days on Big Data and competition and consumer protection, and early next year, we'll be focusing on privacy, will probably touch on some of these issues as well. So, with that, I'll yield my time over. Thank you.

HON. DAVID J. PORTER: Thank you, everyone. I'd like to give the panelists an opportunity to ask each other any questions they might have or to react to each other's comments, and then we'll open it up to the audience for questions. Anything from the panel? Okay, audience members? There are microphones on either side here. It's on.

JAMES BOYAJIAN: Good afternoon. James Boyajian with Palace Entertainment. My question is about urgency. The leading innovators and disruptors of our time seem to disagree about how urgent we need to pass new laws and regulations to address gaps in the law in dealing with things like AI and Big Data. Two examples are Elon Musk, who recently stated that artificial intelligence is the greatest single existential threat to human life.⁹⁸ On the other side of the table, you have Mark Zuckerberg, founder of Facebook, who disagrees with that view and believes that passing new regulations would stifle innovations in these areas.⁹⁹ So, what position would you take, in terms of urgency, in passing new laws? Would you say that it's urgent that we have new laws to address the threats posed by these new technologies, and if so, which law makers would be best positioned to do so? Would it be a proactive act of Congress? Would it be your agencies passing administrative regulations? Or, would it be courts or the Executive Branch? Thank you.

HON. ANDREI IANCU: Okay, well, since nobody's jumping in, let me just start by, from an IP point of view, to say that what I think is urgent is to make sure that the United States keeps innovating at the highest levels possible as fast as possible. We need to stay competitive technologically in the first place in order to even get to the question you're posing about whether

⁹⁸ Samuel Gibbs, *Elon Musk: Artificial Intelligence is Our Biggest Existential Threat*, THE GUARDIAN (Oct. 27, 2014), <https://www.theguardian.com/technology/2014/oct/27/elon-musk-artificial-intelligence-ai-biggest-existential-threat>.

⁹⁹ See, e.g., Catherine Clifford, *Facebook CEO Mark Zuckerberg: Elon Musk's Doomsday AI Predictions Are 'Pretty Irresponsible'*, CNBC (July 24, 2017, 7:04 PM), <https://www.cnbc.com/2017/07/24/mark-zuckerberg-elon-musk-s-doomsday-ai-predictions-are-irresponsible.html>.

AI is a threat and regulations can benefit or stifle, because if we don't do that and we fall behind or meaningfully behind in some or all of these areas, we have significant other issues, including national security issues. So, that's first and foremost.

And second, so whatever we do from a government point of view, I think, needs to aim towards making sure we stay competitive technologically. In terms of whether and when we regulate the various issues presented by the panelists, whether they're legal or moral and ethical issues or the like, my own personal view, speaking in my own personal capacity—I'd be thrilled to see what others think—I think we need to take it one step at a time. We need to see exactly what are the technologies we're dealing with and be very specific. Let's not paint with a broad brush because, if we do so, we could potentially create additional obstacles instead of solving problems, so let's be specific. What is the technology at issue? What threats to society does that technology pose? And then balance the pros and cons of regulation. The interference with the speed of innovation versus the need to protect society from the potential risks. So, that's the kind of balanced approach I would take.

HON. MICHELLE K. LEE: I'm glad to jump in with some additional thoughts, adding to what Andrei said. It's interesting, Elon Musk—he believes that AI will lead to dystopia along with Stephen Hawking as well.¹⁰⁰ And, a bunch of other technologists believe that it will lead to utopia, meaning none of us will have to work. We can maintain the same quality of life, and life will be lovely. I think it is all up to us. Technology can be used for good or bad, and it depends upon how we guide its use and what we permit it to do and how we permit it to enter our lives and control our lives. So, that's just a point on that comment there.

In terms of regulations and laws, it really does depend upon the technology area. So, for example, in the area of driverless cars, I mean, the safety of the vehicle tended to be regulated by the alphabet soup of federal agencies—National Highway Transportation Safety Administration, and the list goes on and on and on.¹⁰¹ The licensing and the insurance and operation of a vehicle tended to be state level. So you saw a whole bunch of states enacting legislations from these super permissive—we really have no restrictions on autonomous vehicles in Arizona—which is why all the autonomous vehicle manufacturers test in Arizona and why you saw the accident, I think it was by Uber or whatever—that was in Arizona—versus

¹⁰⁰ Victor Luckerson, *5 Very Smart People Who Think Artificial Intelligence Could Bring the Apocalypse*, TIME (Dec. 2, 2014), <https://time.com/3614349/artificial-intelligence-singularity-stephen-hawking-elon-musk/>.

¹⁰¹ See generally NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., *supra* note 48.

New York, which is extremely restrictive.¹⁰² And then, of course, local governments will have their restrictions as well.

So, it really depends upon, again, what issue you're trying to solve for, and is it a medical AI system, and what regulation would be appropriate. But, to my points earlier, and to Andrei's points, the technology is so new. I mean, if you talk about autonomous vehicles, we don't even know what the form factor is. Some vehicles are completely—aiming for complete autonomy.¹⁰³ Others, more moderate, level three, user-driver intervention.¹⁰⁴ And so, how is any federal agency, with that many different solutions, able to regulate for all of that? And I think we need time. So, in any new developing industry, my thought is that you let the market forces define, you try to allow the innovation to move forward, you allow the free market forces to define the products and services, and, eventually, as it ripens, then there may be consideration for legislation and so forth.

HON. DAVID J. PORTER: The question included the judiciary as a potential actor. I would just say that I think that's probably the least capable branch. I mean, of all the panelists here, I'm certain that I know less about this subject than any of them. Judges decide particular cases in controversies using existing laws. Judges don't look prospectively and try to fashion rules, typically, to address existential problems. So I would think that the judiciary would be the last place you'd look.

HON. MICHELLE K. LEE: What I will say is the issues are going to the courts, though, because—

HON. DAVID J. PORTER: They are.

HON. MICHELLE K. LEE: —we saw that in terms of the iPhone and accessing the data through the back door.¹⁰⁵ So, all these issues are going to the courts, I think, at every level.

HON. DAVID J. PORTER: Yeah.

SHAWN D. HAMACHER: I would just reiterate, also, being on the other side of the table from the regulators in the private sector, reiterate the comments that, to some degree, we have the cart before the horse. I think you have to align on a set of standards, first, before you know what you're going to regulate, and therefore enforce. So, that's important.

¹⁰² Mihir Zaveri, *Prosecutors Don't Plan to Charge Uber in Self-Driving Car's Fatal Accident*, N.Y. TIMES (Mar. 5, 2019), <https://www.nytimes.com/2019/03/05/technology/uber-self-driving-car-arizona.html>.

¹⁰³ See Daniel Gessner, *Experts Say We're Decades Away from Fully-Autonomous Cars. Here's Why.*, BUS. INSIDER (Aug. 29, 2019, 4:40 PM), <https://www.businessinsider.com/self-driving-cars-fully-autonomous-vehicles-future-prediction-timeline-2019-8>.

¹⁰⁴ *Id.*

¹⁰⁵ Gordon Kelly, *Every iPhone Has a Security Backdoor*, FORBES (July 22, 2014, 6:20 PM), <https://www.forbes.com/sites/gordonkelly/2014/07/22/every-iphone-has-a-security-backdoor/#631bfeb04335>.

HON. DAVID J. PORTER: Can we go to this side?

QUESTIONER 2: I have a question about blockchain technology. I know it's not AI, but I'm hoping it's close enough. And, my question simply is, what does the panel see is the pressing intellectual property issues that are going to develop to—going to affect the development of that technology?

OGNIAN SHENTOV: I can address this thing in part. Blockchain is a terrific algorithm that provides for decentralized and confident—for decentralized distribution of data that is very difficult to fake, to alter, or to change.¹⁰⁶ And the good part about it is that it is not central, so it is distributed in a manner that really prevents, almost prevents, alteration.¹⁰⁷ And, the other good side of it is that it essentially avoids the middleman.¹⁰⁸ So, the chances are that a lot of transactions that took a long time in the past would probably need a handshake at the end, and you may avoid lawyers, actually, frankly, if the mechanism is set up [for] people to transact in a way that allows them to do it with no fear of alteration.¹⁰⁹ I think that may be a great idea.

Specifically in the context of intellectual property, I think it probably has application in areas where it's important when some concept was invented, who invented that concept? So, potentially to resolve ownership issues, which we all—it appears that all of us anticipate that the ownership issues could be pretty big. So, if you use blockchain, you may be able to establish exactly who said what to whom and when. I think it is a terrific prospect. We probably may need to have another session specifically on this one. Thank you.

HON. DAVID J. PORTER: Yes, ma'am.

MICHELLE ROBERTS: Good afternoon. Michelle Roberts of the New York Young Lawyers Chapter. Many of the panelists talked about who are the winners and who are the losers from Big Data. One of the winners, I hope, will be investors who can achieve better outcomes and better financial futures with more information and more transparency related to their investments. And certainly, Wall Street is licensing and aggregating the Big Data sets that we've been discussing and mining them and harvesting them for clues about the economy and markets. And, that begs the question from government and regulators as to whether or not this information is disclosed. Is it possibly material, non-public information if it needs to be licensed and mined and aggregated in some of the ways that we've been discussing today? So, my question to the panelists is, have you considered Big Data and its implications as it relates to regulation FD or insider trading? Thank you.

¹⁰⁶ Luke Fortney, *Blockchain Explained*, INVESTOPEDIA, <https://www.investopedia.com/terms/b/blockchain.asp> (last updated June 25, 2019).

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

HON. DAVID J. PORTER: You need an SEC commissioner.
[Laughter]

HON. ANDREI IANCU: Okay, well, just to have somebody speak on the panel, again, I'm at the U.S. Patent and Trademark Office. I don't view us as a regulator, *per se*. I will say, you raise a very important question. From an IP point of view, IP is based, in large part, on disclosure. Usually, there is a *quid pro quo*. This is in the traditional patent sense, copyright sense, even trademark sense, as opposed to a trade secret sense. So when applications are made for patents, a requirement is to disclose, publicly, the basis for the patent and exactly what you have come up with.¹¹⁰ If that is—it is going to raise issues because if we're talking about machine learning, especially vis-à-vis Big Data type of inventions, sometimes that might call into a disclosure question—into question the disclosure requirements, and that could be quite problematic from a privacy point of view. It hasn't really come up yet, I don't think, in any meaningful way, because we're not quite there for those types of innovations.

The other side of intellectual property that we do have to be mindful of is trade secrets, and for the entities and the people who want to protect that type of data, we do have to have appropriate laws in place to protect its secrecy. And, that is another form of intellectual property. Luckily, we do have the Defend Trade Secrets Act that Congress passed a few years ago.¹¹¹ I think Michelle was in position at that time, and it is a very good piece of legislation that can help in this regard.

HON. DAVID J. PORTER: I had a follow-up question on that for the two PTO directors. In copyright law, the fundamental distinction is between ideas and expression. And, if you have, through AI machines generating expressions, what would—I guess the point of that distinction is to protect the unique human agency that's involved in expressing particular propositions. But, if it's a machine generating that proposition, what would be the point of giving it copyright protection?

HON. MICHELLE K. LEE: So, there's a case, a copyright case, *Naruto v. Slater*, and I think some of you may have heard about it.¹¹² Basically, of all things, a monkey took a selfie photograph of himself, and the question is, who has copyright ownership to that photograph?¹¹³ And, the court held that the non-human monkey could not.¹¹⁴ But, that's the issue, which is who will have ownership to these non-human created expressions, inventions, and so forth. And, I think what we need to do is we need to look

¹¹⁰ 37 C.F.R. § 1.56 (2019).

¹¹¹ See 18 U.S.C. § 1836 (2016).

¹¹² See generally *Naruto v. Slater*, 888 F.3d 418 (9th Cir. 2018).

¹¹³ *Id.* at 420.

¹¹⁴ *Id.*

back at the underpinning of our intellectual property system. And it's, according to the Constitution "[t]o promote the Progress of Science and [the] useful Arts."¹¹⁵ So, what does our system need to look like in order to best promote the progress of science and the useful arts?

HON. ANDREI IANCU: So, Your Honor, let me just address—to piggyback on Michelle's last point. First of all, Naruto's lawyer was sitting here. I saw him. He must have just left probably before you asked the question. But, Naruto did have a lawyer that represented him in the action. And, it was a fun case. But, it addressed the question under the current statute, who is an author? Can an animal, a non-human—well, an animal in that case—be an author? I would say that that's a different question from whether a machine can be an author or an inventor because, while we might not have an interest as a society to promote creative acts by monkeys taking selfies, for example, or creating art, we might have an interest as a society in promoting, and therefore protecting and rewarding machines created by humans to create further technology or further art. That is a policy debate that needs to be had. I don't think we've had it yet as a country. The statutes are currently as they are, but in decades or hundreds of years now—but it is a different question—also from a judiciary's point of view if a case comes up—I do think it's a different question from whether the animal, who was not created in any way or programmed in any way by a human, has those rights.

HON. DAVID J. PORTER: Okay. Yes, sir?

QUESTIONER 4: So, this is drawing from Mr. Cooper's comments, but certainly happy to hear from anyone. If we're talking about restricting the use of data versus the collection of data, how do you strike the balance between doing that approach and protecting trade secrets? If we're talking about things that are difficult to patent, I can understand not wanting people to have to put too many cards on the table. But, at the same time, we're talking about applications that seem difficult or maybe even impossible to detect if they're not being disclosed to the FTC or whomever else. So, how do you strike that balance?

JAMES C. COOPER: So, is the question—when you're talking about use and disclosure, I'm talking about collection of data from consumers. And so, you're talking about trade secrets or . . . ? I'm sorry, I just want to make sure I understand the question.

QUESTIONER 4: Yeah, so if the method of analyzing or using data is what we're regulating versus regulating the collection, how do you do that with without making someone disclose too much—

JAMES C. COOPER: Oh, I see. I understand. Yeah, no, that's a

¹¹⁵ U.S. CONST. art. I, § 8, cl. 8.

good question as far as—and I don't think I'm necessarily saying—what you're talking about may be—I don't want to put words in your mouth—something like algorithmic transparency—this is what we're doing with the data, and we want to make sure that's transparent, and we want to disclose that to a regulator. I don't think you need to look at what's in the black box and necessarily have that disclosed. I think you just want to look at the outcomes.

So, going back to my privacy versus discrimination dichotomy. If you're having disparate outcomes from an algorithm, well, you'd look at the outcomes. You don't necessarily need to know—in fact, I think that algorithmic transparency is somewhat overrated because consumers don't read a privacy policy. Consumers don't read anything. Are they going to really—because there're lots of calls, and I don't want to pick on certain laws of other jurisdictions, but that these algorithms—even down to the code—need to be transparent. I'm not really sure how useful that would be.

When I say the difference between restriction and use, what I really mean is you want to focus on—I'm sorry, between collection and use—is you want to focus on practices that end up being harmful to consumers in some ways. So, you want to focus on harm to consumers, not *ex ante* prohibit the collection of certain types of data in sort of a *per se* manner—the analogy in antitrust would be like a *per se* rule—we're not going to allow anyone to do this; it's just illegal—as opposed to let's let you collect data, but if you use it in a way that harms privacy, that is discriminatory in a way that we as a society don't like, then we'll go there. But, I don't think that necessarily would require disclosure. Now, maybe if you got into the nuts and bolts of an FTC action, maybe it would—or any action, it would be part of discovery. But, we can already deal with that stuff through the normal courts. I don't know if that answers your question, but that's my answer.

HON. DAVID J. PORTER: I received, about two minutes ago, I received a signal that we have five minutes left. So, let's try to handle the next few questions in about a minute each, if possible. Yes, sir.

CARL DOMINO: Thank you. Carl Domino. There's much news about a possible trade war with China.¹¹⁶ That has two dimensions, what is physical goods—which is handled by tariffs or competitive nature—but the other is intellectual property—which we read is mandated transfers by companies that want to go over there and/or stealing IP. In your comments, Director, you indicated that they were increasing their patents by twenty-four

¹¹⁶ See David J. Lynch, *Trump Faces Crucial Decision on China as Both Economies Strain*, WASH. POST (Oct. 7, 2019, 6:00 AM), https://www.washingtonpost.com/business/economy/trump-faces-crucial-decision-on-china-as-both-economies-strain/2019/10/06/f6ce524c-e6db-11e9-b403-f738899982d2_story.html; Dennis P. Halpin, *China Is Winning Trump's Trade War*, NAT'L INT. (Oct. 6, 2019), <https://nationalinterest.org/feature/china-winning-trumps-trade-war-86116>.

percent a year for over a decade. Are they getting anywhere near the patent portfolio where it's no longer their interest not to obey international norms of IP patent protection?

HON. ANDREI IANCU: It's a good question. And they have—so, in China, they have changed their IP system and their patent protection system over the past number of years.¹¹⁷ They have continuously, in some respects, improved their system.¹¹⁸ In many respects, the Chinese IP regime has come closer to international standards. In other respects, the IP protection regimes in China are still lacking. And we still see significant issues vis-à-vis the treatment of IP, especially IP from foreign companies, such as U.S. companies.¹¹⁹ So, we're paying very close attention to that aspect. And my main point in my opening remarks is that, irrespective of all that—and all that is really important—irrespective of all that, the United States must continue to innovate on our own terms to make sure that we stay competitive, no matter what they do over there.

HON. MICHELLE K. LEE: If I could add one quick point to that, on the issue of China and the U.S. and the number of patents, I think it's important not to just look at the numbers because there are patents that can be filed in China that are unexamined, and you have some rights. Our patents are examined, and it is true that the Chinese government has been setting quotas and incentives for local industries in given areas, and they have been giving subsidies to folks to file patents.¹²⁰ Well, if you're a communist system, and you're going to incentivize a quota, you will get what you ask for, just like they had in the system where they had to meet a certain quota of nails. So, people produced lots of nails that were really tiny that didn't serve the purpose.

So, all I would say is, let's be careful. We clearly need to focus on the innovation in our country and incentivizing it and keeping it strong. But, on the other hand, the mere number alone is not enough. And, I would commend you to look at a book called *AI Superpowers: China, the Silicon Valley, and the New World Order*. We are in the first of nine innings in the area of artificial intelligence.¹²¹ And, what the book says is that in the area of

¹¹⁷ Jeffery Langer, *Rapid Changes in the Chinese Legal System, an Increasingly Attractive Venue for IP Litigation*, IP WATCHDOG (May 7, 2018), <https://www.ipwatchdog.com/2018/05/07/rapid-changes-chinese-legal-system-attractive-venue-ip-litigation/id=96099/>.

¹¹⁸ *Id.*

¹¹⁹ See Paul Morinville, *A Journey Through the Chinese Patent System: The Differences in How Patent Rights Are Treated*, IP WATCHDOG (Oct. 7, 2018), <https://www.ipwatchdog.com/2018/10/07/journey-chinese-patent-system/id=102117/>.

¹²⁰ See, e.g., Emma Barraclough, *The Rise of China's Film Industry*, WORLD INTELL. PROP. ORG (Apr. 2016), https://www.wipo.int/wipo_magazine/en/2016/02/article_0004.html; Peter Finnie, *Why China's Impressive Patent Rates Don't Tell the Whole Story*, NSTECH (Feb. 11, 2019), <https://tech.newstatesman.com/guest-opinion/china-patent-rates>.

¹²¹ See Kai-Fu Lee, *AI SUPERPOWERS: CHINA, SILICON VALLEY, AND THE NEW WORLD ORDER* x-xi (2018).

novel inventions, the U.S. is still ahead.¹²² In the area of implementation, China is ahead. But, who will prevail at the end? Still to be determined. We're only in the first inning.

HON. DAVID J. PORTER: I'm sorry, we are out of time. But, thank you to our panelists for a great discussion.

¹²² See *id.* at 26.

