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Defense Innovation Board Public Listening Session

Stanford Institute for Economy Policy Research

366 Galvez Street

John A. & Cynthia Fry Gunn Building

Stanford, CA 94305

Reported by: Chris Spievak

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A P P E A R A N C E S

Courtney Greenley

Joshua Marcuse

Dr. Richard Murray

Andrew Grotto

Charles Allen

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1 P R O C E E D I N G S

2 MS. GREENLEY: Good afternoon. Everyone, I
3 think, has taken their seats. So let's go ahead and
4 get started.

5 My name is Courtney Greenley. I serve as the
6 Alternate Designated Federal Officer for the Defense
7 Innovation Board. It is my role to open this public
8 listening session of the Science and Technology
9 subcommittee of the Defense Innovation Board.

10 Thank you to Stanford University for hosting
11 us for today's session. If you have not done so
12 already, please do silence your electronic devices.

13 This session is part of the Defense
14 Innovation Board initiative called the Artificial
15 Intelligence Principles Project. Today's session is
16 being recorded and live streamed to allow members of
17 the public to attend virtually. It will also be
18 accessible on the board's website,
19 Innovation.Defense.gov. Thank you to the Defense
20 Media Activity for providing their expert support to
21 this event.

22 Welcome to all of our in-person and virtual
23 attendees. As we begin this public listening session,
24 allow me to share a few procedural remarks. This
25 board is a discretionary independent advisory board

1 operated under the Federal Advisory Committee Act and
2 the Government Sunshine Act. Today's meeting was
3 announced in the Federal Register Notice on February
4 15, 2019. There have been no significant changes to
5 the meeting's agenda as posted in the Federal Register
6 Notice.

7 The public was invited to submit written
8 comments for the board members to consider. Nine
9 written comments were received in advance of today's
10 session. These comments will be posted online with
11 the minutes of the meeting. We welcome additional
12 written comments on a rolling basis, which can be
13 submitted via our website.

14 The primary purpose of this session is to
15 provide an opportunity for members of the public to
16 provide verbal written comments -- verbal comments to
17 the board subcommittee today. As a reminder, these
18 are comments to the board, not a question and answer
19 session. Board members may ask clarifying questions.

20 With that, I now turn the meeting over to the
21 board's executive director, Joshua Marcuse for his
22 opening remarks and introduction of our board members.

23 MR. MARCUSE: Welcome, everyone, and thank
24 you for joining us for the second official public
25 listening session in the Defense Innovation Board's AI

1 Principles Project.

2 Public participation in this process is
3 essential to the design of this project and intrinsic
4 to the purpose for which federal advisory committees
5 like ours were formed. Whether you came here today to
6 make a public comment or to listen, your presence
7 today is an important part of our deliberative and
8 consultative process.

9 Special thanks to Stanford University for
10 hosting us. In particular, the board recognizes the
11 contribution of the recently launched Institute for
12 Human-Centered AI, which graciously agreed to host
13 today's session. Michael Sellitto, the deputy
14 director, played an instrumental role in assisting us
15 with these preparations. We're honored to be at one
16 of the nation's premiere institutions for AI research,
17 development, thought, leadership, and application.

18 I regret to say that our chairman, Dr. Eric
19 Schmidt, who teaches here at Stanford and is a
20 technical advisor at Alphabet has been called away on
21 urgent business and sends his regrets. In lieu of Dr.
22 Schmidt, we'll have Dr. Murray, who is one of the co-
23 chairs of the Science and Technology subcommittee,
24 chair this listening session.

25 Let me introduce Dr. Murray. He's at the

1 end. Also, he's joined by Jennifer Pahlka, who's the
2 founding executive director of Code for America, and
3 also is the co-chair of our Workforce Behavior and
4 Culture subcommittee. And we also have Mr. Milo
5 Medin, who is the vice president of wireless services
6 at Google and is also a member of the Science and
7 Technology subcommittee.

8 So let me give a brief overview to set the
9 context for this conversation and talk a little bit
10 about the origin of the principles project and what it
11 is that the board is engaged in doing.

12 So last July the Department of Defense asked
13 the board to undertake an effort to establish a set of
14 AI principles for defense. After several months of
15 planning and internal discussions, in early 2019, the
16 board began convening a mix of academics, researchers,
17 ethicists, lawyers, business executives, nonprofit
18 leaders, venture capitalists, policy experts, and a
19 variety of others who are leaders in the AI field to
20 provide input in the information gathering phase.

21 The board is taking care to include the
22 perspectives of not only experts who often work with
23 the department, but also AI skeptics, DoD critics, and
24 leading AI engineers who have never worked with the
25 department before. There may be disagreements among

1 this group since these matters may be controversial,
2 but the board has not shied away from respectful and
3 forthright dialogue. That should lead to meaningful
4 understanding on all sides and a robust contest of
5 ideas should generate new insights.

6 As explained in the recently released DoD AI
7 strategy, which I encourage all of you interested to
8 read -- it's available on the website -- DoD
9 recognizes the need to view AI differently than other
10 technologies, places particular emphasis on AI ethics
11 and safety, which is a distinct line of effort in the
12 AI strategy and clearly affirms the imperative to get
13 this issue right.

14 AI systems not only affect the men and women
15 who serve our country, but societies around the world.
16 That is why the board has committed to a different
17 process than what we typically do, with particular
18 emphasis on transparency, inclusion, and robustness.
19 We want everyone to take part in this dialogue because
20 these issues touch everyone.

21 Today's public listening session is just one
22 element of the board's broader initiative to gather
23 that input. So let me lay out for you how the rest of
24 this session will unfold.

25 In a moment, I'll ask Dr. Murray to call this

1 session to order and say a few words on behalf of the
2 DIB. Then, we'll ask Mr. Andrew Grotto, the William
3 J. Perry International Security Fellow at Stanford
4 Center for International Security and Cooperation and
5 a research fellow at the Hoover Institution.

6 After Mr. Grotto, we'll ask Mr. Charles
7 Allen, Deputy General Counsel for International
8 Affairs of the Department of Defense to speak on
9 behalf of DoD's legal community on how policies and
10 laws around human rights and armed conflict intersect
11 with the emerging legal and ethical issues involving
12 AI.

13 Following Mr. Allen's remarks, we will begin
14 with the public comments for the remainder of the
15 time, and members of the audience can engage the board
16 members and express their views on behalf of
17 themselves or organizations that they represent. When
18 we get to that point, I'll explain a little bit about
19 the mechanics and how public comments will work in
20 detail.

21 But what I'll say now is if you haven't
22 already grabbed a comment card, one of these, please
23 do so. They were at the front desk as you walked in,
24 or we can hand them out to you, but we need to get
25 your name and contact information so that we can

1 correctly identify you in the transcript. And so if
2 you want to make a comment, you can just hand those up
3 to me or give it to a member of my staff, and we will
4 call on people in the order that they submitted their
5 comments or request to speak online. And once we've
6 exhausted the list of people who requested to speak in
7 advance, then we'll turn to audience members who
8 submitted comment cards.

9 And my hope is that with about, you know,
10 more than two hours we'll have time for everyone that
11 wants to make remarks to do so. In the unlikely event
12 that we run out of time, I strongly encourage you to
13 submit a comment online.

14 All of the comments are read and reviewed,
15 not only by the staff and by the board, and they all
16 become part of the public record and part of the
17 report. So please do look at our website for regular
18 updates on how the project is unfolding.

19 So these comments will be no longer than five
20 minutes. I will give everyone a warning at four
21 minutes by tapping the podium, and at five minutes I
22 will have to ask you to step down so that everyone has
23 an equal amount of time.

24 So that being said, let me turn it over to
25 Dr. Murray.

1 DR. MURRAY: Thank you, Josh, and thank you,
2 all, for coming and joining us here today, and thank
3 you to Stanford University for serving as host.

4 So the purpose of this session, as Josh said,
5 is to hear from the public about ethical and
6 responsible use of AI for the Department of Defense.
7 It's very important to us that we hear all of the
8 views as we try and help the Department of Defense
9 think through what those principles should be. So I
10 thank you for coming, and I encourage you, as Josh
11 already has, if you have a comment that you'd like to
12 make, please fill out a card and make a comment.

13 It's a little bit of a strange dialogue
14 because we are -- as Josh will tell you in a little
15 bit, we're not allowed to kind of go back and forth
16 with you. We sort of get to listen primarily in this
17 session and hear, and then we, you know, kind of get
18 to do our side of putting things out a little bit
19 later.

20 So this is really a listening session. We
21 really want to hear from you, what do you think the
22 department ought to be thinking about and ought to be
23 thinking about and ought to be taking into account in
24 the area of ethical and responsible use of AI for the
25 Department of Defense. So thank you for coming today.

1 Thank you for the comments that we'll get from you as
2 the day goes on, and we really appreciate your
3 participation in this process. With that, I'll turn
4 it back to Josh.

5 MR. MARCUSE: So as I said, I mean Stanford
6 is a place not only where groundbreaking AI research
7 is done, but where groundbreaking international
8 security research is done, where many of the leading
9 thinkers in our nation come to teach and to learn. We
10 can't imagine a more appropriate place to have this
11 discussion than here at Stanford. And so to represent
12 Stanford, I'd like to ask Mr. Andrew Grotto to come
13 say a few words.

14 As I mentioned earlier, he's an International
15 Security Fellow in the Center for National Security
16 and Cooperation who represents Hoover. His research
17 explores the national security and international
18 economic dimensions of America's global leadership and
19 information technology innovation and its growing
20 reliance and innovation for its economic and social
21 life.

22 Before Stanford he served as the White
23 House's Senior Director for Cyber Security Policy and
24 a Senior Advisor for Technology Policy and Secretary
25 of Commerce, and on Capitol Hill to a number of other

1 national security roles. So very appropriate person
2 for us to hear from as we kick off this discussion.
3 Andrew, the floor is yours.

4 MR. GROTTO: Welcome to Stanford. We're
5 thrilled to have you on campus for this important
6 conversation. My name is Andy Grotto. I'm a -- why
7 don't I start over for the benefit of the folks who
8 are streaming?

9 My name is Andy Grotto. I'm a relatively
10 recently arrived D.C. ex-pat here at Stanford, having
11 served in both the Trump and the Obama administrations
12 as Senior Director for Cyber Policy and National
13 Security Council.

14 We have some really exciting initiatives
15 underway here at Stanford on technology issues. I'm
16 launching a new program here on geopolitics,
17 technology, and governance under the banner of an
18 exciting new research center on technology and
19 international affairs. The new center will be housed
20 at Freeman Spogli and launched in the coming months.
21 Stay tuned for more on this in the near future.

22 To the members of the DIB, I want to thank
23 you for your service. You all have day jobs and are
24 committing your time and energy in the service of your
25 country on an extraordinarily sensitive and

1 challenging topic, AI Ethics. Your efforts to
2 contribute to the design of an ethical compass for AI
3 and DoD's mission have the potential to shape
4 strategic and ethical thinking in defense strategy for
5 many years to come. You have my gratitude.

6 What makes a compass work is the fact that
7 magnets have two poles. The push and pull between
8 these two poles is what determines the orientation of
9 the needle. When one of those poles is distorted or
10 absent, the compass will lead us astray. In other
11 words, in a compass, harnessing and managing tension
12 is essential to finding direction. I think the same
13 is true for AI ethics.

14 One way to think about your mission is how
15 best to harness and manage the various tensions,
16 pushes and pulls on the debate about the role of AI in
17 the National Defense domain. This requires open
18 respectful debate, careful deliberate thought and
19 production. Your presence here today and the
20 Department of Defense's broader efforts at outreach
21 and engagement are evidence to me that you
22 wholeheartedly agree and are hungry for partners,
23 sounding boards, and even respectful critics.

24 And I think there's no better place to have
25 this conversation than at a university, particular

1 this one, here in the heart of Silicon Valley where
2 scientists, engineers, and policy makers are trained
3 and where so many innovations in technology have
4 occurred.

5 So let me also extend my gratitude to the
6 people here today from the Stanford and the broader
7 community. You have so much to bring to this
8 important discussion. Indeed, if you care about the
9 safety, security, and ethical bearings of this
10 country, you have a responsibility to join this
11 debate.

12 I submit to you all that the Defense
13 Innovation Board is not sitting now to design a
14 proprietary compass for the Department of Defense to
15 own and lock away. It is designing a compass that
16 reflects our values as a country. It will be our
17 compass as much as it is DoD's.

18 I also want to encourage you all, if you
19 don't get a chance to speak today, provide written
20 comments to these folks. Having served in government
21 myself and been involved in many of these types of
22 engagements, I can promise you that your comments will
23 get read, considered, and debated by the people in the
24 room today.

25 So thank you, all, for being with us. And I

1 hope we're able to continue this dialogue for the
2 indefinite future. Thank you.

3 MR. MARCUSE: Perfect. Thank you, very much.
4 Our next speaker will be Mr. Chuck Allen. Mr. Allen
5 is an undergraduate alumnus of Stanford, so something
6 of a homecoming for him. And he's served as DoD's
7 Deputy General Counsel for International Affairs since
8 2000. His area of responsibility encompasses a wide
9 range of issues, including law of armed conflict, war
10 crimes, war powers, activities of US forces under
11 international law, United Nations Security Council
12 resolutions, and international litigation.

13 Prior to his position he served in the Navy
14 where his career spanned numerous positions in the
15 legal community, culminating as the Deputy Legal
16 Advisor to the National Security Council, as part of
17 the US Navy Judge Advocate General's Court. Mr. Allen
18 will walk us through how he and his colleagues are
19 advising DoD how to apply AI use cases within the
20 framework of the law or a variety of applications.

21 Mr. Allen, over to you.

22 MR. ALLEN: Thank you, very much, Josh. I
23 appreciate that introduction. I'm really happy to
24 have this opportunity to give you some background
25 about the Department of Defense's practice of law,

1 legal practice, and especially our strong commitment
2 to the law and ethics.

3 We are, in fact, committed to compliance with
4 the law in all DoD programs, activities, operations,
5 including compliance with the law of war in all
6 military operations. The law of war is also known as
7 the law of armed conflict and international
8 humanitarian law or IHL. And for the most part I'm
9 going to be using IHL in this talk.

10 Our leaders in the department have especially
11 focused on ethics and legality. Acting Secretary
12 Shanahan's recent memo to the department stated, "A
13 key component of leadership is reinforcing ethical
14 behavior across the full spectrum of our work and
15 recognizing ethics principles as the foundation upon
16 which we make sound informed decisions."

17 These words reflect the approach that DoD
18 also applies to AI. Earlier this year, DoD released
19 an unclassified summary of its strategy on AI. I was
20 very happy to see that the strategies, one of its five
21 pillars is leading in military ethics and AI safety.

22 The strategy describes in this pillar DoD's
23 intention to lead in AI ethics and safety by
24 articulating and realizing the vision and guiding
25 principles for using AI in a lawful and ethical

1 manner, including to improve civilian protections
2 under the law of war, investing in research and
3 development for resilient, robust, reliable, secure,
4 and explainable AI and also all the while promoting
5 transparency.

6 Our work on the responsible use of AI builds
7 on existing DoD policies. You may not know this, but
8 one is DoD's directive on autonomy in weapons systems,
9 really before its time, initiated in 2012 under the
10 tenure of then Deputy Secretary of Defense Ash Carter,
11 who issued the directive which is binding on the
12 entire department after careful study of past DoD
13 practice in using autonomy in weapons systems, such as
14 the Patriot missile system and the Aegis Combat
15 System.

16 The directive captured lessons learned from
17 past experience in using weapons systems with
18 autonomous functions. It establishes strong
19 guidelines to minimize the probability of failure and
20 the consequences of any failure in autonomous and
21 semi-autonomous weapon systems that could lead to
22 unintended engagements, such as unexpectedly harming
23 friendly forces or civilians.

24 Again, the directive dating back even to 2012
25 has the following overarching requirement. Policy

1 statement: "Autonomous and semi-autonomous weapon
2 systems shall be designed to allow commanders and
3 operators to exercise appropriate levels of human
4 judgement over the use of force."

5 It requires realistic and rigorous testing,
6 clear human-machine interface, and training for
7 commanders and operators that is commensurate with
8 their responsibilities. In addition, compliance with
9 the law, including international humanitarian law,
10 underlies all DoD programs and operations. It's
11 foundational, as well, to DoD's responsible use of
12 artificial intelligence.

13 So international humanitarian law itself is a
14 well-established body of law that governs conduct
15 during armed conflict at its core. The US Military
16 has a long history of law of war compliance. This is
17 touched on in some depth in the DoD Law of War Manual,
18 which I'll say a little bit more about in these
19 remarks. I'm very glad to be accompanied by the chief
20 author of that manual over about a seven-year period,
21 Karl Chang, who is with me.

22 For the United States, the law of war
23 includes the treaties of the United States that the
24 United States has accepted, such as the 1949 Geneva
25 Conventions, and many more, as well as customary

1 international law. The law of war seeks to reduce
2 unnecessary suffering in war. It protects civilians
3 and other persons who are hors du combat or out of the
4 fight.

5 The law of war permits targeting of enemy
6 combatants and military objectives and only military
7 objectives, like enemy tanks and aircraft, but it
8 prohibits the targeting of civilians and protected
9 objects, such as hospitals and museums.

10 As I mentioned DoD's longstanding policy is
11 to comply with IHL in all military operations, whether
12 in armed conflict or not. DoD has robust processes to
13 implement IHL, including for training, required
14 reporting of incidents involving alleged violations,
15 and this goes for our forces, foreign forces, absolute
16 requirements to report any such violations and
17 investigations and reviews of incidents and corrective
18 actions, which, of course, can include discipline or
19 judicial processes as appropriate.

20 We have our 1,200-page Law of War Manual
21 authored by Karl Chang and with a little help from all
22 the military departments and many others. It collects
23 and explains law of war requirements. I commend it to
24 you. I think it's a good thing to have on your
25 desktop. It's incredibly searchable, and it actually

1 has gotten a lot of play, I think, worldwide in
2 academies, but most importantly for its target
3 audience, which is all of our practitioners around the
4 world in the Department of Defense.

5 It's authoritative guidance for DoD
6 personnel, and is available publicly online. We are
7 always actually welcoming comments as well. We've
8 made a couple of revisions to the manual. We try to
9 keep it current, of course. The DoD General Counsel's
10 website has it along with quite an extensive
11 compilation of other official documents on the law of
12 war.

13 Practitioners, DoD has thousands of military
14 and civilian lawyers advising commanders and decision
15 makers on legality, including IHL compliance wherever
16 our people are around the world. They review the
17 intended acquisition of weapons. Imagine all of the
18 systems command of all the military departments
19 throughout the country and all the way up through the
20 subcabinet and sometimes the cabinet level in
21 Washington, D.C., advising on the legality of those
22 acquisition decisions. They review all military
23 plans, operations orders, and rules of engagement.

24 I'd like to mention three ways in which
25 international humanitarian law can inform DoD's

1 responsible use of artificial intelligence. Now, I
2 don't mean to suggest that IHL provides all the legal
3 answers on AI. It clearly does not. As noted in the
4 DoD AI strategy, the department is seeking to harness
5 the potential of AI to transform all functions of the
6 department positively and not just AI as it relates to
7 weapons or the nations wars.

8 Depending on the type of application, AI
9 could raise other legal issues, for example, privacy,
10 civil liberties, or medical ethics issues. As for
11 IHL, however, DoD has deeply internalized compliance
12 with it. As the DoD Law of War Manual puts it, the
13 law of war is part of who we are. You'll find this to
14 be true among all the military departments, including
15 US soldiers -- I'm happy to see a US soldier here with
16 us today -- sailors, airmen, and marines all around
17 the world, and Pentagon senior leaders alike.

18 Because the law of war reflects the
19 department's ethical values, like accomplishing the
20 mission the best way we can for the American people
21 and protecting civilians, IHL absolutely is an
22 important part of the department's approach to using
23 AI in armed conflict.

24 First, I'd say that existing IHL rules apply
25 with new technologies, such as cyber or new types of

1 AI are used in armed conflict. That's true. All
2 matters of that sort get legal reviews. The law of
3 war actually anticipates technological innovation and
4 contemplates that its existing rules will apply to new
5 means and methods of warfare.

6 IHL rules can apply to new technologies
7 because although some rules are specific to certain
8 types of weapons in IHL, there are IHL rules relating
9 to mines, incendiaries, and the like, but IHL rules
10 generally are not framed in terms of specific
11 technological means.

12 For example, the rules on conducting attacks
13 do not depend on what type of weapon is used to
14 conduct the attack. So if AI is used to help DoD
15 perform an activity that is subject to IHL, like
16 conducting an attack, that activity continues to be
17 subject to applicable IHL rules, including that
18 attacks must be directed against military objectives
19 only. Attacks must not be conducted when they are
20 expected to cause excessive collateral damage, and
21 feasible precautions must be taken to reduce the risk
22 of harm to civilians.

23 Another way IHL can inform DoD's use of AI is
24 through its principles. These are covered, I think,
25 very nicely the black letter law as well as many

1 annotations going into more depth. But some of the
2 fundamental principles of IHL are military necessity,
3 humanity, distinction, proportionality, and honor.

4 Now, these principles provide a general guide
5 for conduct during war where no more specific rule
6 applies, principles are still referred to. Or said
7 another way, even if there's not a specific
8 international law rule prohibiting something, by no
9 means is it the case that anything goes. Rather, it's
10 still always important to consider whether your IHL, a
11 contemplated action is justified by military necessity
12 and to ensure an action is not unreasonable or
13 excessive under the principle of proportionality.

14 In this way, the fundamental principles of
15 IHL provide a framework to consider novel legal and
16 ethical issues posed by emerging technologies, such as
17 AI. In international discussions on emerging
18 technologies, we have said in Geneva forums on
19 emerging technologies that the group of governmental
20 experts of the parties to the convention on
21 conventional weapons the following. "If the use of a
22 new technology advances the universal values inherent
23 in the law of war, such as the protection of
24 civilians, then the development or use of this
25 technology is likely to be more ethical than

1 refraining from such use."

2 This leads to my third point about IHL that
3 informs DoD's use of AI, using AI expressly to improve
4 our implementation of civilian protections. The law
5 recognizes that civilian casualties are a tragic, but
6 at times unavoidable part of armed conflict. IHL
7 requires that militaries take feasible precautions to
8 reduce the risk of casualties, civilian casualties.

9 But just as new advancements in AI have the
10 potential to save lives in peace time by reducing the
11 risks of car accidents or improving medical diagnoses,
12 advancements in AI could also help save the lives of
13 civilians during war by improving precautions we can
14 take to protect civilians.

15 One way AI could do this is by making weapons
16 more accurate. Smart weapons are not particularly
17 new. The weapons that use computers and autonomous
18 functions to deploy force more precisely and
19 efficiently have, in fact, been shown to reduce risks
20 of harm to civilians and civilian objects. Weapons
21 systems with automated target recognition allow the
22 weapons to lock onto targets, strike military
23 objectives more accurately, and with less risk of harm
24 to civilians and civilian objects. And when the
25 weapon is more accurate, fewer weapons need to be

1 fired to achieve the same military advantage.

2 Another way that AI could create humanitarian
3 benefits is by improved military awareness of
4 civilians during military operations, simply where
5 they are. The fog of war means that the information
6 available during war is limited and unreliable often
7 due to the chaos of combat and the opposing side's
8 efforts to deceive one another. Due to this fog of
9 war, commanders might be unaware that civilians are in
10 or near military objective. AI likely could help
11 reduce those kinds of mistakes.

12 As a case in point, many of you have heard
13 about Project Maven. It's a DoD effort to use AI to
14 improve analysis of video from intelligence,
15 surveillance, and reconnaissance platforms. By using
16 AI to identify objects of interest from imagery
17 autonomously, analysts can search through much larger
18 quantities of data and can focus on the more
19 sophisticated and important tasks requiring human
20 judgment.

21 We truly believe this kind of work could help
22 improve the commanders' battle space awareness and
23 really help cut through the fog of war. This could
24 mean better identification of civilians and civilian
25 objects on the battlefield, which allows our

1 commanders to take steps to reduce the risk of harm to
2 them.

3 Another common theme underlying potential
4 humanitarian benefits of AI on the battlefield is sort
5 of a convergence between military and humanitarian
6 interests. When use of force is necessary to protect
7 and defend our country and our people, the military
8 wants to use force more accurately, precisely,
9 efficient. We want to make faster and more accurate
10 decisions.

11 These military advantages also bring
12 humanitarian benefits in many cases in terms of
13 reducing the risk to civilians from military
14 operations. In a more direct sense and sort of
15 outside of the armed conflict context, DoD is working
16 on ways to use AI capabilities for humanitarian
17 purposes.

18 The Joint Artificial Intelligence Center has
19 a national mission initiative on humanitarian
20 assistance and disaster relief. They're applying
21 lessons learned and reusable tools from Project Maven
22 to field AI capabilities to help first responders all
23 around the country and, in fact, around the world in
24 many cases, responding to wild fires, typhoons,
25 hurricanes.

1 I'll close now, eager to listen and learn
2 from this session today, along with the DIB members.
3 We recognize the need to be open and to embrace the
4 diversity of ideas. DoD respects the right of
5 individuals and US companies and industry and their
6 workforces to express their views. Of course, it's no
7 surprise to anybody to say this is one of the very
8 freedoms guaranteed by our Constitution, that all of
9 us in DoD are sworn to defend.

10 On an issue like artificial intelligence, we
11 have much to learn from perspectives outside the
12 departments, and we look forward to learning from many
13 of you today. I'm looking forward to getting help in
14 harnessing that tension that was referred to. Thank
15 you, very much.

16 MR. MARCUSE: All right. Now we get to the
17 fun part. So just as a reminder, we will now hear
18 from you, the audience, the rest of our allotted time.
19 Many of you have submitted comments online, and I'll
20 start with those first. If you haven't, please do
21 hand out one of the comment cards. If you need one,
22 raise your hand and a member of my team will get one
23 right to you.

24 And I just wanted to -- another quick
25 reminder, everyone will have up to five minutes. I

1 will tap when you have one minute left, and then we'll
2 wrap up. When you do arrive at the mic, please do
3 state your first and last name clearly for the record
4 and also your affiliation. And I just wanted to
5 emphasize again that we do regret this is not an
6 opportunity for a question and answer session. The
7 board members really want to hear your views on AI
8 ethics and national security. They may ask clarifying
9 questions of you if they wish, but this is really your
10 opportunity to have your views be heard.

11 Due to time constraints, we will need to end
12 at 4:30 whether we've exhausted the list of people
13 that want to speak or not, but hopefully that is ample
14 time for us to get through it. And so with that said
15 I will get started.

16 So the first request we received was from
17 Link Hereek [ph]. Is Link here? All right. Gavan
18 Wilhite [ph]? Glenn Kesselman [ph]? Oh, are you
19 Gavan?

20 MR. KESSELMAN: Glenn.

21 MR. MARCUSE: You're Glenn?

22 MR. KESSELMAN: Yes.

23 MR. MARCUSE: Fantastic. Glenn, I would love
24 to hear from you. And is Stephen Bonn [ph] here? Dr.
25 John Potter? Well, why don't we go right ahead with

1 you, Glenn, and thank you, very much.

2 MR. MARCUSE: Oh, absolutely. We will
3 definitely be getting to you sir. I'm just sort of
4 trying to do, you know, someone speaking and someone
5 on deck, but I will make sure to add you to -- Bow
6 Rodgers [ph]?

7 MR. RODGERS: Yeah.

8 MR. MARCUSE: You bet, sir. We'll definitely
9 be hearing from you today.

10 MR. KESSELMAN: Yeah, Glenn Kesselman,
11 retired Army colonel and technology, cyber security.
12 It's not so much of an ethics question. It's more of
13 a direction question. I understand that, you know,
14 China, President Xi, has issued a very strong
15 directive, you know, for China to focus on AI, and AI
16 courses are even offered in the high schools.

17 It's my understanding, it's my understanding
18 that we have a fragmented policy in the US and that I
19 think this puts us at a very serious, not only
20 competitive disadvantage, but a strategic
21 disadvantage, especially for the military.

22 So I just wanted to express my concern that
23 senior leadership, both in the DoD and the civilian
24 side of the government really focus in on how we can
25 match this very strong initiative that the Chinese

1 government seems to have so we can maintain not only
2 our leadership worldwide ethically, but also in our
3 capability to produce AI systems. Thank you.

4 MR. MARCUSE: Terrific. Thank you, very
5 much, sir. So next up is Marta Kosmyna.

6 MS. KOSMYNA: Yep.

7 MR. MARCUSE: So, Marta, we'll have you speak
8 next. Is Zach Tashdijian [ph] here? Zach? Mr. Toby
9 Walsh? Great. So we'll hear from you, Marta, and
10 then Mr. Walsh, please. If you can start to make your
11 way towards either microphone. Of course, you may,
12 Marta. You bet. So, Marta, if you would please
13 approach the mic when you're ready. And let me see,
14 Mr. Walsh, are you prepared?

15 MR. WALSH: Yep.

16 MR. MARCUSE: Fantastic. So is Professor
17 Herb Lin [ph] here?

18 MR. MARCUSE: Wonderful. So if we could have
19 you next, and hopefully, Marta, by then you'll be
20 ready to go. Thank you, sir. Over to you, five
21 minutes, please.

22 MR. WALSH: Good afternoon. I've spent the
23 last 35 years or more working in artificial
24 intelligence. And five years ago, like many of my
25 colleagues, I started to be rather concerned in the

1 direction that some of the technology was going and
2 the way, in particular it's a concern that many of my
3 colleagues share. In fact, I got a thousand of them
4 to sign an open letter that got a lot of attention at
5 the leading AI conference and was featured in
6 newspapers around the world, raising our concerns
7 about the risks of handing over full autonomy to
8 weapons. And I just wanted to mention a couple of the
9 concerns that I and many of my colleagues have.

10 The first one is that I think often people
11 don't realize that the concerns will change as the
12 technology becomes more sophisticated. And the
13 concerns that you might have today will be different,
14 will change and will be different concerns once the
15 technology is more sophisticated.

16 The source of concerns, and I'm just going to
17 focus on technical issues. I mean there are many
18 legal, moral, and other issues that I think that we
19 should be thinking about, but just calling upon my
20 background as an AI researcher, the technical concerns
21 that I would have in terms of having full autonomy in
22 targeting.

23 The concerns today with the sorts of weapons
24 that you see being prototyped now, are that -- the AI
25 is a very brittle technology. We talk about

1 artificial intelligence, and it's a name that we have
2 for better or for worse. Many of us dislike the use
3 of the name. And the word intelligence is a very
4 misleading one because we are guided by our own
5 intelligence without realizing that the sorts of
6 algorithms that we can build, the sorts of computer
7 vision systems, breaking waves that human visual
8 systems don't break.

9 We can change a single pixel. We can rotate
10 an image by a few degrees and get a completely
11 different result. That's not the sort of technology
12 you want to be putting people's lives into the hands
13 of.

14 There are other technical concerns you'd have
15 today. The fact that every computer system that we
16 know that we can build, someone is going to hack. And
17 so you would have the possibility that these could be
18 used for quite distasteful ends. And then the
19 concerns that, you know, we were promised that we were
20 going to be given smart weapons in the Gulf War and
21 elsewhere, and then we see that nine out of ten of the
22 people being targeted by drones are not the intended
23 target. That's why you still got a human in the loop.

24 And if I was given the task of trying to
25 match what the human can do today with their finger on

1 the trigger with the presence of a drone, I will be
2 aiming to make nine out of ten mistakes. That's when
3 you still got a human with a great situational
4 awareness.

5 So there's some of the sorts of technical
6 concerns one would have today. And then as the
7 technology becomes more sophisticated, the concerns
8 change. They're not the same concerns you'll have in
9 ten years' time, or 20 years' time. And these would
10 ultimately be quite terrible weapons, that they would
11 be -- we're not going to keep a technical lead on
12 anyone. The history of military technology is one
13 that you've -- any technology that's been developed
14 has been developed by the other side or gets stolen by
15 the other side very shortly.

16 These are going to be weapons which are going
17 to be easy to replicate. You're not going -- it's not
18 like you can have proliferation where you have to get
19 your hands on this material. There's going to be
20 cheap, plentiful weapons. They are, as we said back
21 in 2015, they are going to be the Kalashnikovs of the
22 future. And so we're going to have to expect to be on
23 the receiving end of them. And that's going to be
24 rather destabilizing in an already a very destabilized
25 world.

1 There's lots of absolutely great things that
2 the military can use AI for. You know, I always like
3 to point out clearing a mine field, we should never
4 have a human ever do that again. We should only ever
5 get robots to do that. When it goes wrong, we're
6 going out and getting a new robot.

7 And even in weaponry there's plenty of good
8 things. Many of the arguments I hear for the
9 humanitarian benefits that we will get from having
10 smarter weaponry are ones that you will get even if
11 you don't have full autonomy. If you make, for
12 example, the weapon smart enough to disable itself
13 when it realizes that is not a valid military target.
14 You don't have to give the decision to the machine.
15 You can actually make it smarter and get those
16 humanitarian benefits without full autonomy.

17 And we do have a brief window, I think, today
18 to --

19 MR. MARCUSE: Wrap up, sir.

20 MR. WALSH: -- to avoid an arms race that we
21 do see starting to happen, that will be -- take us to
22 a very dangerous place, and one where our global
23 security won't be improved. In fact, we'll be harmed.
24 The existence of these weapons will make warfare and
25 the world a much less safer place. Thank you.

1 MR. MEDIN: -- missions not being properly
2 targeted. Do you have a -- what's the reference for
3 that?

4 MR. WALSH: That was the, that was the
5 intercept, the drone papers that they leaked out at
6 the Pentagon, that suggested in the --

7 MR. MEDIN: Do you have a date by any chance?

8 MR. WALSH: I'd have to go back and check --

9 MR. MEDIN: I'll Google it. That's fine.

10 MR. WALSH: I think it was 2017.

11 MR. MEDIN: Okay.

12 MR. WALSH: That's it.

13 MR. MARCUSE: Great. So we'll hear from
14 Professor Lin. Thank you.

15 MR. LIN: Herb Lin, Stanford University. So
16 I wanted to bring up three issues. One is the
17 question of over-trust in AI systems. One is the
18 question of explainable AI, and the other is a comment
19 about the principles itself.

20 On the over-trust issue, one of the things
21 that I worry about, having seen lots of people
22 interact with computer systems, is that they trust
23 computer systems way too much. And one of the best
24 examples I know of this is a recent demonstration of
25 people trying to follow a robot out of -- who was

1 trying to lead them out of a, you know, simulated
2 burning building, and they followed the robot into
3 blind alleys and rooms with no other doors in them and
4 so forth, even after they had seen the robot screw up.
5 So I worry about that a lot.

6 If we have AI systems that are going to be
7 ubiquitous, which is what we keep on hearing, that's a
8 tendency that breeds over-trust. You sort of see it
9 all the time. You sort of start to trust it, and you
10 easily start to over-trust it. I want to put in a
11 plea for AI systems that know when they are operating
12 outside of their zone of confidence. AI systems
13 should not always give you the best possible answer.
14 It should give you sometimes an answer that says, I
15 have no idea what I'm doing here, don't trust me. And
16 that, to me, is a really important aspect.

17 On the explainable AI system there are very
18 few things that terrify me more than recommendations
19 made when I -- or conclusions drawn when I can't
20 interrogate the reasoning. Dartmouth has had a long
21 time and had a program for explainable AI. As I
22 understand, the progress there is slow, but that's a
23 really important thing to be able to explain the
24 reasoning behind some conclusion, some
25 classifications, and so on.

1 And that will help boost the commander's
2 confidence in using them. Imagine a commanding
3 control system that advises the commander about a
4 suggested course of action. Commander wants to be
5 able to say, why did you tell me that, what's the
6 reasoning for that. And it'll also result in better
7 IHL compliance because of what happens in the fog of
8 war. You want to be able to explain a decision, why
9 did this weapon destroy this particular target and it
10 turned out to be a civilian? What were the
11 characteristics? What were the circumstances of it?
12 He needs to be able to explain that.

13 And the last thing is about the principles.
14 I think the -- someone said at the beginning of this.
15 I can't remember who said that the principles for AI
16 should be -- are different than they are for other
17 kinds of technology. I want to push back on that or
18 at least question that assumption a little bit.

19 It seems to me that many of the principles
20 that I've seen articulated for ethical and responsible
21 use of AI are just the same as you would say if you
22 were -- if the words were technology enabled or
23 something like that. I have written pieces on both
24 these things, and I'll be submitting them for the
25 record.

1 MR. MARCUSE: Tremendous. Marta Kosmyna.
2 Campaign to stop killer robots. And Evelyn, if you
3 would, please, I would recommend speaking about two or
4 three inches away from the microphone and use your
5 best outdoor voice to make sure that live stream can
6 hear us loud and clear. Thank you.

7 MS. KOSMYNA: Sure. Can everyone hear me
8 loud and clear?

9 MR. MARCUSE: Perfect.

10 MS. KOSMYNA: All right. As I said, my name
11 is Marta Kosmyna. I'm the Silicon Valley lead for the
12 campaign to stop killer robots, which basically means
13 I am engaging the tech sector out here and academia
14 and the media and letting them know what we're all
15 about. We're basically a coalition of 106
16 organizations operating in now 54 countries working to
17 preserve meaningful human control over weapon systems.

18 I just wanted to respond a little bit to the
19 comments made by Mr. Allen earlier because we
20 participate very heavily in the international process
21 at the United Nations to get new international policy
22 to get a preemptive ban on fully autonomous weapons.
23 And we do hear from the US delegation the line that
24 international humanitarian law is sufficient, and
25 there should be a renewed focus on article 36 reviews.

1 So the thing about international humanitarian
2 law is when it was written, I don't think we could
3 even imagine a world where weapons were not controlled
4 by humans where selecting and engaging a target was
5 not done by a human hand. And international
6 humanitarian law also requires individual criminal
7 responsibility.

8 And with this new class of weapons it is --
9 there has been created an accountability gap where
10 it's unclear who will be held responsible, whether
11 it's the program, the robot, the machine itself, the
12 commander, and is a commander willing
13 to -- at the state of technology we have now and at
14 the rate it's progressing -- if they're not able to
15 understand how a system works and how an algorithm
16 reaches its conclusions and to put their own soldier's
17 lives at risk, are we willing to put that
18 responsibility and accountability on a commander.

19 In terms of article 36 reviews, I think the
20 ICRC said that out of the 100 or so countries that
21 produced weapons last year, only about 20 of them
22 conduct article 36 reviews. So that's not a very good
23 percentage. It's great that the United States has a
24 rigorous ethical review process, but we need to take
25 into account countries that do not follow similar

1 rules.

2 We often hear the argument that fully
3 autonomous weapons would be more accurate, fewer
4 weapons would be fired, it would save soldiers' lives,
5 but we believe that these similar -- these things
6 could be achieved with semi-autonomous systems and
7 that we don't need cede control over weapon systems to
8 achieve these same aims.

9 Yeah. I think we'd want to submit further
10 comments in writing, but thanks for the opportunity to
11 speak.

12 MR. MARCUSE: Thank you. And let me say also
13 how much we would welcome those comments in writing
14 from anyone that wants to submit them, and they can be
15 submitted at our website, innovation.defense.gov,
16 which I believe is right up there. So please do make
17 an oral comment, but also written comments very much
18 welcome.

19 Is Renata Barreto [ph] here?

20 MR. MARCUSE: All right. Mr. Rodgers?

21 MR. RODGERS: Thank you. My name is Bo
22 Rodgers. Hopefully that's audible. I earned a bronze
23 star serving in combat in Vietnam, but that's not my
24 purpose for coming up. I have a company called Vet
25 Tech. We find, develop, and fund veteran-led high-

1 tech startups. I'm here with some other combat
2 people. And I was not intending to come up and speak.
3 I was just moved by the ethical response.

4 In Vietnam we had a saying, friendly fire
5 isn't. And the poignancy of that comment really is
6 aimed at as you prioritize how we apply AI, and I
7 always like to use cases really from the attorney who
8 are really up here. I think it is the friendly fire
9 concept and who is in harm's way and how do we apply
10 AI. 'Cause in the field of combat it's not atypical
11 that your enemy will surround themselves with a body
12 of civilians. That's part of the process of this.

13 So I'm only encouraging as you sit down and
14 on a whiteboard, however you assemble to use cases of
15 AI, the money that's been spent, I really think and
16 encourage you that our troops and those of civilians
17 really is at the top of the list of AI. 'Cause I'm
18 sure there's a myriad of ways we could apply AI in
19 different military uses, but I really encourage you,
20 that's got to be right up on top. Thank you, very
21 much.

22 MR. MARCUSE: Thank you, very much, sir. Is
23 John O'Brien? Anthony Aguirre? Great. Anthony,
24 please.

25 MR. AGUIRRE: Hi, I'm Anthony Aguirre. I'm a

1 professor of physics and I'm a cofounder of an
2 organization called the Future of Life Institute.
3 We're a small, but highly successful, nonprofit that
4 has led numerous efforts to advance the beneficial and
5 ethical development of AI.

6 Our organization has submitted written
7 comments with 11 practical recommendations for the
8 board that I will summarize for them in our comments
9 right now.

10 So first, the DoD should adopt and translate
11 the widely endorsed Asilomar AI Principles. In 2017,
12 FLI helped develop 23 Asilomar AI Principles through a
13 deliberative consultative process. They've been
14 signed by over 1,200 AI researchers, including some of
15 the most foremost researches in academia and private
16 industry. Last year the principles were also endorsed
17 by the State of California. Several of the principles
18 are highly relevant for the board to use in the
19 bedrock AI principles for defense.

20 Second, human judgment and control should
21 always be preserved in the use of weapon systems so as
22 to avoid delegation of critical decisions or in a way
23 that can be scaled to large numbers of autonomous
24 agents. The future AI principles for defense must
25 continue to ensure, as stipulated in DoD directive

1 3000.09, that commanders and operators can exercise
2 appropriate levels of human judgment over the use of
3 force. Further DoD should advocate for this inclusion
4 of this more stronger standard by international
5 partners, including NATO and by our near peer
6 adversaries.

7 Third, critical AI systems should be
8 subjected to rigorous testing and operational
9 exercises prior to deployment. This testing should
10 have the explicit goal of manipulating AI systems into
11 recommending unethical decisions through adversarial
12 examples, reward hacking, and active red reaming.

13 For example, foreign combatants have long
14 been known to use civilian facilities, such as
15 schools, to shield themselves from attack when firing
16 long distance rockets. An AI system supporting target
17 acquisition in those situations must be intentionally
18 tested to try to provoke it and to recommend -- to
19 provoke it to recommend unethical decisions, such as
20 recommending to engage when collateral damage would be
21 unacceptable.

22 Testing of AI systems should ensure liability
23 and alignment with human preferences, robustness
24 against attack, protections from misuse and close
25 monitoring of the intersection of AI with other weapon

1 systems, such as nuclear command and control.

2 MR. MARCUSE: Anthony, if you would, just a
3 little bit closer to the mic.

4 MR. AGUIRRE: Sorry. Fourth, DoD and
5 especially the Jake should maintain a central
6 classified inventory of how, where, and for what
7 purpose different AI systems are developed for
8 national security purposes. We have reservations
9 regarding the desire articulated in the DoD's 2018
10 strategy to enable the centralized development and
11 experimentation at the forward edge in order to scale
12 and democratize access to AI.

13 While well-intentioned, overly decentralized
14 development and experimentation may quickly lead to
15 applications of AI systems for tasks that they were
16 not specifically designed for. These unplanned uses
17 may result in unethical and unsafe outcomes. To
18 protect against these potential outcomes, the Jake
19 should maintain centralized inventories with
20 information on the design and acceptable uses of all
21 AI systems and make this inventory available for
22 independent oversight by the inspector general and
23 congressional committees.

24 As research develops in AI safety and machine
25 ethics and DoD adopts new policy accordingly, these

1 inventories will also facilitate the deployment of
2 updates to all relevant AI systems to maintain proper
3 and ethical and responsible use. Thank you for your
4 time and consideration of our written and oral
5 comments.

6 MR. MARCUSE: Terrific. So let me just ask,
7 is there anyone that requested to make a comment
8 online whose name I've not called? Wait. So we may
9 have had a little gap. So if you wouldn't mind, just
10 please fill out one of these forms, 'cause I'm moving
11 to those now. So please just raise your hand and Erin
12 will hand them out to you. We're very much looking
13 forward to hearing from you. Thanks for bearing with
14 us.

15 Next, we have Glenn Dawson, please, and Lucy
16 Suchman after that. Glenn, over to you. Thank you,
17 very much.

18 MR. DAWSON: Thank you, Josh. Thank you to
19 the Defense Innovation Board. My name is Glenn
20 Dawson, and I'm the CEO and founder of Valkyrie
21 Systems Aerospace. We built an aerospace system that
22 is designed to resupply and rescue wounded soldiers.
23 And as it started off that way three decades ago, the
24 artificial intelligence and the machine that has
25 actually been built now into the aircraft to do that

1 one mission caught up, it was critical to put the
2 artificial intelligence onboard of the aircraft.

3 In order to see a rocket propelled grenade,
4 literally at the time of release or to put a defensive
5 capability on it and actually save the life of the
6 warrior in the battlefield that is ever changing, it
7 is critical and imperative that we actually be able to
8 see in microseconds really what we actually take a
9 defensive action or strategic defensive capability
10 against.

11 Standing back and waiting for our enemies to
12 fire us with the rules of engagement is nice in the
13 rule books and the IHL's. If there's anybody that's
14 been in the battlefield and had somebody shooting at
15 you, the best-made plans that you actually go out
16 there with change dramatically and instantaneously.

17 As we start to look at the what-if's of
18 scenarios of artificial intelligence, the humanitarian
19 things that have come off the battlefield technology
20 that we designed and built into these aircraft can now
21 fly into hurricanes using ground-penetrating radar,
22 hyperspectral, as well as other cameras and sensors to
23 give us a real-time data computer analysis onboard, if
24 the roads and bridges are safe for our first
25 responders to go in on.

1 We could transport goods and actually go into
2 more landing positions and actually bring
3 communications in response back to those areas that
4 are contested. So as we look towards the life and how
5 we can actually help our brothers in humanitarian
6 areas, like that of Puerto Rico or if we have a major
7 wildfire here in California again, these cameras and
8 sensors can now literally tell the ulcerations on
9 power lines through the thermal images that we're
10 picking up off the hyperspectral.

11 We could also then actually view risk
12 mitigation and risk analysis towards the future
13 predicted analytical results that will actually come
14 into event. So we can now look at three, six, nine-
15 month time cycle of vegetation, power lines, whether
16 it be using the long wave hyperspectral to look for,
17 say methane gas coming off a pipeline, or if it's a
18 naturally-occurring methane and separate those two and
19 tell you when you need to go out and service that
20 pipeline.

21 Right now it could take six weeks to a month
22 or more to actually get a service member into the
23 field to service some of our national pipelines.
24 That's too long. So as we start to look at actually
25 how we're going to fly with a pilot in command under

1 these forms, we can actually have right now 27
2 aircraft in the air. And each one of my aircraft
3 right now is collecting terabytes and terabytes of
4 data every hour.

5 I process the known phenomenology of the
6 client, and I process that, and I actually take that
7 packeting off in neural time, but I've also been
8 banking for many years now all that raw data that we
9 can now go back and look for purchase or resale and
10 how are you going to bring that out.

11 So the ethics that we as a board and as a
12 company suffer with is we know too much, and we don't
13 want that getting out there. We also want to protect
14 us as citizens and individuals of our privacy as we
15 start to go forward and actually started launching
16 hundreds of vehicles into the air.

17 So we thank the DIB for bringing up this very
18 incredible issue. And we think that there are very,
19 very good things to be learned from these efforts. So
20 thank you.

21 MR. MARCUSE: Thank you, very much. And we
22 have Lucy, Professor Lucy Suchman. And if you would
23 like to speak, please make sure that we have your
24 card.

25 MS. SUCHMAN: Yeah. Thank you, very much.

1 I'm here because I was invited by the board to
2 participate in the panels that are occurring tomorrow,
3 and I want to thank the board for that. I believe I
4 probably fall into the category of AI skeptic. And
5 I'm speaking based on many decades of engagement with
6 the field. And I would just like to enter some
7 comments into the public record as well.

8 And I want to focus my comments on the
9 question of target identification, which is a critical
10 part of the proposals for the introduction of AI into
11 weapon systems. And in particular, the relationship
12 between target identification and rule number one of
13 international humanitarian law, which is the principle
14 of distinction between those who are in combat and
15 those who are outside of combat.

16 And as we know, we're in a period of so-
17 called irregular warfare where that question of who
18 actually constitutes a combatant, who constitutes an
19 imminent threat is more problematic for humans to
20 address than it has ever been before. Articulating
21 the criteria for making that distinction is extremely
22 difficult.

23 And I think it's crucial that we distinguish
24 in the language of precision and accuracy the
25 difference between the precision with which a weapon

1 which has been targeted will actually strike the
2 designated target and precision in the identification
3 of targets.

4 So my central concern in my engagement with
5 these issues has to do with seriously addressing the
6 question of what are the criteria for the
7 discrimination between those who are inside of combat
8 and those who are outside of combat, and for the
9 identification of an imminent threat that warrants the
10 initiation of force. And I will leave it to all of us
11 to think about the current and possibly imagine the
12 future state of AI in relation to the challenges that
13 that question poses.

14 MR. MARCUSE: Thank you, ma'am. So we will
15 hear from Mr. Chris Cundy first and Dr. Amanda Askell,
16 you are on deck.

17 MR. CUNDY: Hi, there. Cool. So I'm a PhD
18 student at Stanford CS Department, and I just wanted
19 to say that I'm very glad that the DoD is taking AI
20 ethics seriously. So to me, as someone who does
21 research in this field, it's very clear that AI is
22 posed to be an extremely important general use
23 technology over the next few decades.

24 And I think one of the key aspects of AI is
25 that many of the applications are dual use. So you

1 get large benefits, but you have the potential of
2 large downsides as well.

3 As an example, better language models can let
4 us communicate fluently with computer systems, but
5 they can also lead to convincing fake news that can
6 destabilize democracy. Better drone controlling
7 software could be used for search and rescue
8 applications, but also for drone weapons for
9 insurgents in asymmetric warfare.

10 And I think the DoD has a really unique place
11 as a big sponsor of AI research, and I hope that this
12 AI ethics initiative will lead to a more concerted
13 evaluation of the long-term impacts, both good and
14 bad, of the research that they fund.

15 I think a second point that's interesting to
16 me is that it's very unclear what the impact of AI
17 will be on the geopolitical landscape in the future.
18 So some features of AI seem very likely to lead to a
19 more turbulent geopolitical situation in the future,
20 such as autonomous weapons. Meaning it's easier to
21 have wars with fewer casualties and less political
22 implications, but other features seem to lead to more
23 centralization of power and less turbulence. Those
24 are things like efficiency of surveillance and facial
25 recognition, which mean the authoritarian regimes can

1 get more entrenched in power.

2 And I think a key problem is even if the
3 world is very turbulent, even if there are no explicit
4 bad actors, if there are more sort of political
5 tensions all around, then accidents or
6 misunderstandings are much more likely to occur. We
7 saw those things with some close calls with nuclear
8 weapons during the cold war.

9 But I think the US government and the DoD has
10 been in the past a key agent for ensuring global
11 stability and steering the world away from dangerous
12 dynamics that have arisen with previous powerful
13 technologies, such as nuclear or biological weapons
14 and cyber warfare. And this was achieved both by
15 research that identifies key dangerous aspects of
16 those powerful technologies and also strong
17 international agreements to responsibly develop those
18 technologies and avoid dynamics that could be
19 dangerous like arms races.

20 And I really hope that the DoD ethics board
21 will allow the US to continue to lead the world
22 towards a great future where AI is used responsibly
23 for the benefit of all and those dangers are
24 preemptively identified and dealt with. Thanks.

25 MR. MARCUSE: Perfect. Now we have Dr.

1 Amanda Askell from Open AI, and John Alsterda from
2 Stanford, you are on deck, sir.

3 MS. ASKELL: -- mostly read our comments that
4 I made online, so --

5 MR. MARCUSE: Amanda, if you're just a little
6 bit closer to the mic.

7 MS. ASKELL: Okay. I'm right at the mic. Is
8 that okay? Okay, cool. So I think that the ethical
9 and responsible use of AI mainly involves principles
10 that are quite uncontroversial. So people have talked
11 about things like, you know, avoid unnecessary
12 civilian casualties and avoid accidentally creating
13 conflict that wouldn't have otherwise existed.

14 I think a key problem, though, is going to be
15 finding ways of assuring that you abide by those
16 principles in particular cases with particular
17 systems, especially when they're deployed in like
18 particular environments.

19 And so an example of this might be, you know,
20 you deploy an automated navigation system without
21 realizing that it's going to like move vessels into
22 foreign territory if it's just given data that's like
23 sufficiently unlike the data that it's had before. So
24 that would be a kind of like disastrous system to
25 deploy.

1 And if you just had either no checks or
2 imperfect checks, like relying on things that people
3 have already talked about, like human-in-the-loop,
4 which are really quite imperfect, you could end up
5 just violating an extremely obvious principle, like
6 don't create unnecessary conflict completely
7 unintentionally by just like not knowing about the
8 system in question.

9 So if this kind of view of responsible AI
10 deployment is correct, then I think one key issue is
11 just going to be finding both expertise about the
12 domains in which these systems are being deployed,
13 which I think the DoD has, but also expertise in the
14 systems themselves and like some of the like
15 foreseeable consequences if you're working on them
16 technically, may not be foreseeable if you are not
17 working on the systems themselves.

18 And I think if that's right, then like a key
19 source of expertise here is going to be coming from
20 like industry and academia where these systems are
21 being developed so that, and where there are people
22 who like spend most of their time actually thinking
23 about like the potential for either the misuse of
24 these systems, you know, that like people have talked
25 a little bit about systems being hacked, for example,

1 and but also adjust like potential for accidents from
2 those systems, as well as like potential like societal
3 impacts that one didn't anticipate. So we heard that
4 with like language models and being used as an example
5 of that.

6 Yeah, so if this is correct, then it's going
7 to be important to like combine these two types of
8 expertise, and I think this is going to be extremely
9 useful for being sensitive to things that
10 differentiate AI from previous technology. So its
11 particular data, hardware, talent dependencies, also
12 the difficulty of identifying the reasons behind its
13 outputs, its dual use potential, its novel
14 capabilities, and combining that with like
15 sensitivities to the environment that it's being
16 deployed in.

17 Like I said, you know, being aware of the
18 ways in which your system could react badly to new
19 data is like very important. If this is right, then
20 closer collaboration between the DoD and industry and
21 academia might be kind of necessary in order to
22 actually apply these principles well, and if that's
23 correct, then I think that one issue is going to be
24 like the question of how to foster that kind of
25 relationship.

1 It seems at the moment there's a fairly large
2 intellectual divide between the two groups. And so a
3 lot of my comments just support the steps that I think
4 could be taken to like improve that relationship. So
5 I think a lot of AI researchers wouldn't fully
6 understand the concerns and motivations of the DoD and
7 are uncomfortable with the idea of the work being used
8 in a way that they would consider harmful, whether
9 unintentionally or just through lack of safeguards.

10 I think that a lot of defense experts
11 possibly don't understand the concerns and motivations
12 of AI researchers. So they're not necessarily
13 concerned about things like protectionism and
14 aggressive foreign policies as kind of like article of
15 faith, but rather because their like genuinely
16 concerned about the kind of potentially disastrous
17 consequences of introducing like extremely new
18 powerful technology into things like warfare.

19 So I think paying attention to both concerns
20 and kind of having a way of communicating them would
21 be quite valuable. So I think this is like an example
22 of a step that could be taken, explaining the concerns
23 and motivations of the DoD and its portrait of AI
24 technology, both in general but also importantly with
25 respect to particular systems, 'cause that's where a

1 lot of the questions are going to be raised. Like why
2 are you using this particular system, what are the
3 benefits and costs, all of that.

4 And I think also being receptive to the
5 concerns of AI researchers and opens the possibility
6 that it's underestimating the cost of developing new
7 military technologies would be probably appreciated by
8 people in industry.

9 I think also avoiding treating the AI
10 industry like a single entity. It's a group of
11 companies, researchers, research institutes, academic
12 institutes, that very often differ in their views and
13 in their concerns, and it can sometimes feel like it's
14 just treated as one giant industry that has the same
15 views on everything and the same concerns, and that's
16 just like not accurate.

17 I think also allowing -- this is like kind of
18 a final recommendation, but I have others that I've
19 conveyed in the document, but allowing companies to
20 negotiate their engagement with the DoD. So in
21 assisting in the development of systems where
22 guarantees are made that the system will be used in
23 the way described and kind of mechanisms for oversight
24 that could be put in place to do that, I think that's
25 like another thing that potentially means that there's

1 going to be a better relationship between industry
2 bodies and the DoD.

3 So, yeah, I think key takeaways that I wanted
4 to emphasize are just that sometimes the principles
5 here aren't hard, but getting them right in really
6 specific cases is, in fact, hard and just requires
7 expertise both from people who understand like the
8 field and the environment in which they're being
9 deployed. Also people who really thoroughly
10 understand the ways in which those systems can go
11 wrong, and so giving some recommendations as to how to
12 do that. Thanks.

13 MR. MARCUSE: Thank you. Good. And next we
14 have John from Stanford Engineering followed by
15 Maynard Holliday from RAND Corporation.

16 MR. ALSTERDA: Hi, I'm John Alsterda, a PhD
17 student in mechanical engineering. This is just one
18 aspect that I feel strongly about with DoD and AI. I
19 think that bringing AI into the military gives us an
20 unprecedented opportunity to record and document the
21 actions of our military.

22 Our military has been subject to a long
23 history of disturbing allegations of unethical
24 behavior and potential war crimes. Some of them may
25 be true or untrue. I'm not here to debate those

1 facts. However, among the valid concerns brought
2 today, it is imperative that we use this new
3 technology to hold ourselves accountable to the
4 actions that we commit as a country.

5 We must deploy this new technology with
6 transparency, collecting the evidence necessary to
7 hold our integrity, to fight false allegations, and
8 also to take responsibility for our potential
9 wrongdoings. Thank you.

10 MR. MARCUSE: So next we have Dr. Maynard
11 Holliday from RAND Corporation and on deck Dr. Mira
12 Lane from Microsoft.

13 MR. HOLLIDAY: Good afternoon. I'm not
14 speaking for RAND Corporation. I'm speaking for
15 myself, having been in this field for 30-plus years,
16 having served in the Pentagon in a senior role and
17 being on the Defense Science Board, summer study on
18 autonomy.

19 So what I'd like to tell the board is, you
20 know, there's a difference between ethics and the code
21 of conduct. And you should differentiate between the
22 two and look at codes of conduct that are available in
23 different technological settings. And also to
24 Professor Lin's earlier point about trust, engage and
25 look for external oversight to give you validation

1 both from the technological community as well as the
2 public.

3 And then I'd like to say to the people and
4 community that says you shouldn't employ AI. You
5 know, when we study this, and, again, as pointed out
6 by earlier speakers, the cat is out of the bag
7 proverbially and technology is diffuse and global, and
8 our adversaries don't have the same ethical
9 constraints or values as us who are going to be using
10 it.

11 So we should, at the very least, be able to
12 defend ourselves and work at machine speed to do that.
13 And so that may mean there's some malady, you know,
14 when there's -- when we're defending ourselves. But,
15 again, I'd like to say the US never wants to be in a
16 fair fight. And, you know, that helps us all to
17 defend the freedoms that, you know, we all hold dear.
18 Thank you.

19 MR. MARCUSE: All right. I just want to
20 remind you if you would like to make a comment today,
21 we're nearing the point where you have to make that
22 decision. So please do consider whether you'd like
23 to. At the moment, Mira is our last speaker. So if
24 you're interest, this is your chance. Over to you,
25 Mira.

1 MS. LANE: Okay. Hi, my name is Mira Lane,
2 and I am the director of ethics and society at
3 Microsoft. And I wanted to share five points.

4 First, the technologies need not be used in
5 the way we use them today. And they need not be used
6 in the manner that Hollywood has envisioned them. So
7 we must actively push against the technological
8 determinism. There's no such thing as just
9 introducing new technology. All things change when
10 one thing changes.

11 So some examples of questions we should be
12 asking. What is the impact to soldiers and the nature
13 of warfare as new technology is inserted into the
14 field? How can we obtain the data we need to create
15 robust and reliable AI systems, as we know AI systems
16 are incredibly brittle and corrupt? And what are some
17 of the likely ways that this technology may
18 proliferate beyond our intended use and into adjacent
19 industries, such as law enforcement.

20 My second point is that the threat gets a
21 vote. And so while in the US we debate the moral,
22 political, legal, and ethical issues surrounding
23 lethal autonomous weapons, our potential enemies might
24 not. The reality of military competition will drive
25 us to use technology in ways that we had not intended.

1 If our adversaries build autonomous weapons, then
2 we'll have to react with suitable technologies to
3 defend against the threat. So this dynamic of
4 innovation and counter-innovation could lead to
5 surprises in warfare that changed what the military
6 sees as ethical.

7 My third point is that conflict entails
8 uncertainty. It is impossible for programmers to
9 anticipate ahead of time all of the unique
10 circumstances surrounding an engagement with an
11 adversary. Even the operational testing can only
12 approximate actual conditions in the use of technology
13 in combat. We know that soldiers will face wartime
14 conditions where the environment, adversary
15 innovation, chaos, confusion, and violence of war all
16 contribute to unexpected challenges.

17 My fourth point is that transparency is
18 essential. And decisions cannot be made away from
19 public scrutiny. So it is important to consult with
20 scientists, ethicists, lawyers, humanists, and put
21 checks and balances inside the development and
22 application of technology. This form is a great
23 example of what we must continue doing.

24 States must also be able to trust that others
25 are not secretly developing a weapon or technology

1 that they have foresworn, because this could lead to
2 an escalation of development. And so the question I
3 have is what is the worldwide rule of the DoD in
4 guiding the responsible development and application of
5 such technologies.

6 My last point is that with every new
7 development of technology, new domains of ignorance
8 are discovered, which become evident only as the
9 technology proceeds. And the emergence of domains of
10 ignorance is basically inevitable. And so some of the
11 side effects could not have been known, but the
12 existence of these domains of ignorance is
13 predictable.

14 So I would encourage you to find ways to
15 create tight iteration loops and learnings and
16 feedback systems. Thank you.

17 MR. MEDIN: -- about proliferation autology
18 into areas like law enforcement. I'm just trying to
19 understand what the -- what you meant by that from the
20 DoD ethics question.

21 MS. LANE: Some of the concerns we have are
22 what happens to technologies as they mature and
23 whether they proliferate into any sort of adjacent
24 fields. And so the question is, would any of these
25 technologies ever go beyond what their initial

1 intended use is? Do they go into adjacent injuries
2 that we had not thought about?

3 MR. MARCUSE: Great. We will hear from Jean-
4 Claude Monney followed by Peter Dixon.

5 MR. MONNEY: Thank you. My name is Jean-
6 Claude Monney. I'm actually the former chief
7 knowledge officer from Microsoft, retired two years
8 ago and currently digital advisor, and I really
9 applaud this initiative here. And my remarks here is
10 about knowledge, acquisition and knowledge sharing and
11 knowledge we use.

12 So I had the opportunity to create a course
13 for Columbia University on digital transformation, and
14 one of the topics was AI. And what I discover is that
15 there are many, many countries and organizations in
16 the world developing similar, you know, efforts there.
17 And I -- my suggestion would be that a specific
18 portion of the resources that the DoD is investing
19 into this journey is dedicated to formally analyze
20 what is available already from other countries and
21 other leading organizations in that space.

22 So the UK, for example, has released their AI
23 document last year. You have, therefore, at world
24 economic forum on AI and everybody's talking about
25 what principle do we need to have, what accountability

1 in AI and so on. So I think we could leverage that
2 knowledge is available, publicly available worldwide
3 and really advance your cause much, much faster than
4 you would do by just simple learning.

5 And it's really -- it would happen if you
6 formally dedicate the effort to do that. 'Cause it
7 takes time to review those documents, to review what
8 can be reused, and having a governance process to make
9 the decision what is it that you're going to reuse
10 from others and not having to reinvent the wheel.

11 So this is really me speaking as a knowledge
12 management expert who's been doing this for a few
13 decades. And, really, I think the point made today
14 about, you know, what weapon target and all these
15 things are all relevant, but we can advance this
16 faster if we are open enough to reuse the knowledge of
17 others in that space. That's my remark. Thank you.

18 MR. MARCUSE: Thank you, sir. Next, we have
19 Peter Dixon.

20 MR. DIXON: Hi, thanks for being here. I
21 wanted to stand up and speak for the war fighter and
22 the veterans. So I'm a small tech company owner now
23 here in Silicon Valley. When I was a Marine Corps
24 officer I served in Iraq and Afghanistan. And I just
25 wanted to go ahead and lay out what this actually

1 looks like on the ground because while it's important
2 to think about what the future of warfare looks like
3 and how this could go wrong, I think it's also
4 important to keep in mind the benefits that this has
5 to bring to the battlefield and to create a more
6 ethical near future as opposed to just the risk of
7 this going sideways somehow.

8 So if you think about the different missions
9 that the Department of Defense and the military takes
10 on, it's everything from firefighting to humanitarian
11 assistance, disaster response, right, a lot more than
12 just lethal operations where AI plays an enormous
13 role. However, if you take the scariest concept for
14 Silicon Valley or for folks that may have more
15 questions about this, you think about, you know, a
16 flying robot, a flying drone exercising a lethal
17 strike, what that actually looks like on the ground,
18 I've been an adviser to forces in Iraq -- to local
19 forces in Iraq and Afghanistan.

20 So it's, you know, for instance, Peshmerga
21 Kurdish fighters pinned down behind a berm, taking
22 casualties, right, screaming on the radio for help to
23 call in an American airstrike. And you're advising
24 these forces, but because we're afraid about taking
25 casualties, we're behind the enemy -- we're behind the

1 frontline, and they're asking for this strike. And
2 we've had a predator or reaper overhead for days, but
3 there aren't enough eyeballs to look at all of the
4 screens.

5 So in addition to there being, you know, 15
6 ISIS fighters in a fortified position, what the drone
7 saw, but somebody didn't see, was that there are 30
8 civilians also in that compound. And so that's
9 information that the AI can see and can respond to.
10 And we can say, listen, you know, sorry guys, we can't
11 support you with the airstrike. Right? You need to
12 figure out how to get out of that situation, but we
13 can't call it in. There are civilian casualties
14 that'll occur.

15 So I think the pertinent question here for
16 the application of AI in the battlefield is if we have
17 an ethical military, which we do -- not to say it
18 doesn't make mistakes, but by in large we do -- are
19 there more civilian casualties that are going to
20 result from a lack of information or from information?
21 Thank you.

22 MR. MARCUSE: Okay. Just pause for a moment
23 and see if there's anyone that would like to be heard.
24 Sure, please, ma'am. If you would state your name and
25 affiliation, sure, go right ahead.

1 MS. KOLESNIKOV-LINDSEY: My name is Rachel
2 Kolesnikov-Lindsey. I am active duty Air Force as
3 well. And I wanted to make one follow-up comment on
4 Peter's that regardless of what we as a DoD decide to
5 do with artificial intelligence, our adversaries will
6 be pushing forward as fast and as hard as they can to
7 utilize it in as many ways as they can. And many of
8 their military forces I would argue are not as ethical
9 as ours.

10 MR. MARCUSE: Thank you, ma'am. Please.
11 Again, if you would just please state your name and
12 affiliation.

13 MS. CAVELLO: Hi there. My name is B.
14 Cavello. I'm a participant in a program called
15 Assembly, which is run out of Harvard and MIT. So I
16 didn't catch you all on the east coast. But I wanted
17 to comment on two particular things that are really of
18 interest to me.

19 One is about how to handle abuses of power.
20 It's a question that's not unique to DoD uses of these
21 technologies. In fact, I've personally experienced
22 abuse by someone who worked at a tech company who had
23 access to a lot of information about people who were
24 users of the technology or people whose information
25 they had access to. I would really like you to

1 consider how decision makers given access to these
2 broad swaths of data about individuals or about
3 organizations can have oversight into how that
4 information is used, especially when those people may
5 act outside of actually the guidances and the
6 limitations of their role.

7 I also wanted to talk a little bit about how
8 there are organizations like the campaign to stop
9 killer robots that really focus on what I kind of
10 think of as the delivery mechanism of action or
11 violence, the idea that there might be some sort of
12 drone or terminator-like robot that is ultimately
13 delivering that action. But to me, what's of much
14 greater concern is actually how the decision about
15 where and against whom those actions should be taken
16 is made in the first place.

17 A lot of the focus of AI technologies is
18 still pretty nascent in the robotic space, but
19 incredibly well-developed in the space of just
20 informational awareness and surveillance. This could
21 be really positive. It could also be really not so
22 good.

23 So as you all are putting together
24 recommendations, I really challenge you and request
25 that you think critically about what processes can be

1 put into place around how these different directives
2 or priorities are actually assigned and what
3 information is being brought into those systems and
4 whether the information that's being used is reliable
5 or whether the people are labeling or assigning weight
6 to that information are in a position of knowledge to
7 be able to interpret that data accurately.

8 Finally, I did want to also just talk about,
9 we've heard whether it be from service members or
10 technologists, a little bit about where there's
11 potential in this space. And I do think that there
12 can be recommendations made that are less about this
13 sort of war fighting and violent action and more
14 recommendations around how to avoid conflict
15 altogether.

16 We all know that resource scarcity is a major
17 motivator and that issues like climate change are
18 really important as we look at the global stability of
19 our future. And so I challenge you to also think
20 about how the recommendations that you make can talk
21 about the ways in which these technologies can be used
22 entirely out of the space of war fighting and instead
23 in the space, whether it be around trying to avoid
24 some of the pressure points that are going to cause
25 massive migrations or other sources of instability or

1 thinking about how areas like investments in AI in the
2 medical space can also prove valuable both for those
3 in the military, as well as those of us in the
4 civilian side of things as well. Thank you.

5 MR. MARCUSE: Thank you, ma'am. Please. If
6 you would please just state your name and affiliation,
7 sir.

8 MR. MARTIN: Hi. I'm Michael Martin. I'm
9 the -- I lead a community of top data scientists at
10 Signal Fire. We're a venture capital firm in San
11 Francisco.

12 I wanted to follow up on the previous comment
13 just a bit and really think about what are the --
14 actually ask the Defense Innovation Board to really
15 think about what are the information privacy sharing
16 on the backend between agencies and the federal
17 government. So what does the model that the DoD
18 creates -- where does that live? What are the
19 controls of what other agencies get shared that with?
20 What does the public process look like for when that
21 happens?

22 So for instance, if you're developing
23 something that's to be used in Iraq or wherever, is
24 that something that now the NSA or Homeland Security
25 can now use without any control. I think that that's

1 something that, you know, we don't want to be in a
2 situation similar to what had come out about the NSA
3 where it was doing domestic surveillance.

4 And I think that that's a major concern for
5 myself, especially when this is the public process for
6 this. But if there's not a public process around the
7 sharing at other agencies, I think that that's
8 something that we generally should be concerned about,
9 and the board should be taking into consideration in
10 the development of the guidelines.

11 MR. MARCUSE: Thank you, Michael.

12 MR. MISHRA: Hi. My name is Saurabh Mishra.
13 I am the researcher manager for AI Index at Stanford
14 Human Centered AI Institute. There's a few questions
15 that I'll -- open-ended questions that I'll pose here.

16 Number one, how could we have a valuable
17 policy discussion and think about principles without
18 having an evidence base? AI as being a data-driven
19 field, there are a lot of open areas in terms of
20 measurement and truly understanding what are the
21 incidence reports for potential risks. So how do we
22 have a valuable policy discussion without data?

23 Number two, what would be an international
24 body, or who would be implementing international rules
25 in this sphere from a multilateral perspective and who

1 are actually thinking about these aspects?

2 Third area is to clarify that we're inspired
3 by humans, but, in fact, AI systems are not quite
4 human at all, and they're super-human because they're
5 very good at specific niche tasks, not diverse like
6 humans who learn from three examples and do something
7 completely new.

8 So from that perspective, as we increasingly
9 learn that predictions become cheaper, the value of
10 human judgement goes up. So the valuation of how
11 human beings weigh costs and benefits and tradeoffs is
12 valued much higher. So that intersection of human
13 decisions based on AI systems, what is the regulatory
14 environment to assess failure in those regards?

15 Another aspect is that of standards of safety
16 and reliability. It's been traditionally done in
17 mechanical systems for, you know, cars and tires. So,
18 again, evidence base of data and regulatory body for
19 safety and reliability.

20 Another aspect is that of increasingly --
21 increasing interest in national AI strategies and
22 competitiveness of nations. There are over 165
23 countries where they do not have an AI strategy plan
24 yet. So what is the US strategic role in building a
25 multipolar AI growth pulse to have a more diversified

1 playing field of AI globally? And national strategies
2 are traditionally inward-looking at the moment. So
3 funnily the 21st century has relatively lower
4 globalization than the previous decades.

5 Understanding and uncovering public
6 investment in the US in AI is almost impossible. And
7 the information asymmetry between US government bodies
8 itself further makes it really hard to track what is
9 public expenditure in AI and how -- if you don't have
10 that evidence base, how do we make a, you know,
11 insightful inference about US role?

12 Another area is that of the role of
13 technology companies. 'Cause there is a growing
14 notion that technology companies may have more power
15 than governments to have access to high-performance
16 computing, even training data than many other
17 countries. So what is the role of policy in that
18 regard? What is the role of uncertainty
19 quantification and the fuzzy areas? We don't know
20 what we don't know. So how do we build policies in an
21 uncertain world, because we don't know how AI systems
22 might respond in such areas?

23 Lastly, in more complex areas of proxy war
24 and asymmetric psychological warfare, the complex
25 combination of malicious state actors and machines,

1 how do we stop thinking about who really has rights?

2 And I will conclude on two questions I
3 started with. What are the multilateral institutions
4 who would be playing a role in these aspects, and what
5 is the evidence base?

6 MR. MARCUSE: Very good. All right. Well
7 this concludes our session. I just want to say, if
8 there is a thought that occurs to you later, please do
9 send it in as the instructions that we followed. I'd
10 like to thank you for joining us. You can go to the
11 website to see updates on this process.

12 The next step will be a public meeting.
13 It'll probably be scheduled in early July where we'll
14 release the first draft of some of the material. And
15 so please join me in thanking our board members and
16 all of you as the participants in this process.

17 MR. MARCUSE: If you are a member of the
18 press and you would like to ask a question, please see
19 Elissa Smith in the black dress in the back corner and
20 go find her, and we'll be linking up with you in a
21 moment.

22 (Whereupon, the meeting concluded at 3:14
23 p.m.)

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I, CHRIS SPIEVAK, the officer before whom the foregoing proceeding was taken, do hereby certify that the proceedings were recorded by me and thereafter reduced to typewriting under my direction; that said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.



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5/4/2019



DATE

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