

Working Group on Maintaining Global Leadership in AI Research

Summary of Conclusions

Meeting #2

The Pentagon

28 June 2019, 1430-1830

Working Group Objective: Identify concrete steps the US can take to maintain global leadership in Artificial Intelligence (AI)/Machine Learning (ML) research and development, with a focus on research that strengthens US national security and defense.

Working Group Approach: Through a comprehensive assessment and analysis of the US and the global AI research landscape and its associated funding and policy mechanisms, develop recommendations to maintain US leadership in the field, to include:

1. prioritization of research areas
2. infrastructure investments
3. funding mechanisms
4. policy and governance changes
5. application accelerants

Meeting Objective: Gain an understanding of current levels of US government investment in AI/ML research, looking at the policies, processes, funding levels and research priorities, particularly as related to defense and national security-related AI research

Commissioners in attendance:

- Andrew Moore, Chair; Eric Schmidt; Eric Horvitz

Commissioners discussed:

1. US Policy-Level Approach to AI R&D:

- Prioritization of AI R&D funding among the core objectives of Executive Order
- Interagency progress report on advancement of AI R&D to be released by the White House this summer.
- 2019 updated National AI R&D Strategy maintains the core strategy with an additional line of effort emphasizing public-private partnerships.
- The Networking and Information Technology Research and Development (NITRD) supplement to the President's Budget will capture AI R&D investments across departments and agencies via a dual approach of a new Program Component Area (PCA) for AI to report investment in the fundamental research, paired with a reporting of the percentage of research in other PCAs that involves AI. DoD and the IC will not report their AI funding for the NITRD supplement.
- The inherent risk in self-reporting incentives.

2. National Security Agencies Investments in AI R&D

- DoD, IC, and DOE recognize the importance in investing in AI R&D to tackle the hard to answer questions, and the areas in which commercial sector has no desire to invest.
- Common difficulties are faced in:
 - Quantifying AI at department levels – i.e. DoD doesn't think of fielded capability as AI.
 - Talent – Recruiting and retaining the level of digital talent to conduct and apply research.

- Lack of creativity – focus on enhancing current capabilities vice creating fundamentally new ones.
- Funding – executing at levels necessary for progress and artificial tension between R&D and Operations and Maintenance funds.
- (b) (5)

3. National Science Foundation

- Funding of computer science related research remains flat as the field skyrockets in importance.
- Absorptive capacity of NSF for additional funds is evident based on the number of high-rated proposals that are not funded annually (\$190 million validated, but unfunded in 2018; \$165 million funded) .
- Research priorities are driven from a bottom-up approach across research community.
- Plan to launch first AI Institutes in FY2020, formed around grand challenge issues, funded at a level of \$5 million/year and above for five years.

Commissioners agreed:

- The U.S. competitive advantage in AI research is at risk sooner than appreciated. US leadership faces sustainability challenges due to talent development and retention issues.
- Rapid Chinese progress and constrained federal basic research funding is further eroding US competitive advantage.
- (b) (5)
- Reporting should illustrate how federal R&D investments laid the groundwork for fundamental technologies that have enabled US geopolitical leadership, transformed society and built new industries.
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The Commission Staff will:

- (b) (5)
- Develop success stories about federal funding of basic research to incorporate in Commission reporting and engagements.
- (b) (5)
- (b) (5)
- Examine collaboration with the Cyber Solarium Commission.
- Follow up to engage subject matter experts for the group.



Working Group on Maintaining Global Leadership in National Security AI Application

Summary of Conclusions Working Group Meeting Tuesday, September 9, 2019, 0800-1700

Working Group Objective: Identify concrete steps that the U.S. can take to maintain its global leadership in Artificial Intelligence (AI)/Machine Learning (ML) application relevant to U.S. national security and defense.

Working Group Approach: Through a comprehensive assessment and analysis of the current state of U.S. national security and defense AI applications and the global AI threat environment, develop recommendations to maintain U.S. leadership in the field, to include:

1. National security organization, policy, and governance
2. Acquisition and application processes and mechanisms
3. Funding and resource requirements

Meeting Objectives: Understand DoD and the Military Services' perspectives on AI application for national security, including: how they see AI's role in future conflicts; their current initiatives and investment priorities; and, how well postured they are to acquire and adopt AI technologies.

Commissioners in attendance:

- Safra Catz, Chair
- Katharina McFarland
- Andy Jassy (SVTC)
- Steve Chien
- (b) (6) (rep for Andy Jassy)

Commissioners received briefs on: The Third Offset, OCEA research on strategic competitors, and individual Service perspectives on AI strategy, priorities, efforts, acquisition, and challenges and opportunities.

Commissioners noted several key takeaways from the working group meeting:

- **The United States has long taken technological superiority is given - it cannot afford to do so anymore.** Its competitors are equally committed to taking the lead. Both China and Russia have concluded that the state that masters AI/ML technologies will likely accrue tremendous future strategic advantages. The U.S. government has set the right direction for adoption of AI for defense and national security purposes but must accelerate its efforts with renewed sense of urgency.

- **The United State military and intelligence community needs to adopt AI at scale in order to maintain military advantage.** The AI will enable our defense and national security agencies to understand faster, operate faster, and execute its mission faster consistent with the laws of armed conflict as well as our democratic values and norms.
- **Like significant military-technological changes of the past, AI requires top-down leadership to overcome cultural and organizational barriers to adoption.** DoD and the IC need to identify senior civilian and military leaders who can drive investment decisions within the budget process and align AI strategies with the resources necessary to implement them.
- **The successes of individual programs within the DoD and IC will not automatically translate into a strategic shift in our application of AI for national security.** Those working on AI initiatives across DoD and the IC recognize its importance and are making progress; however, AI efforts remain on the periphery and small but successful programs are not creating a critical mass for organizational change.
- **AI requires a completely different approach to acquisition.** Effectively adopting AI enabled technologies requires rapid procurement, development, testing, evaluation, and fielding in an iterative and dynamic manner. The current acquisition system was designed for material solutions in which long development timelines with serial testing and fielding was the norm. This approach combined with the current peacetime mentality and risk-averse culture within the acquisition enterprise is inadequate for adopting AI enabled technologies at speed and scale.
- **Trustworthy and reliable AI is an operational necessity.** The minimum threshold for adopting AI-enabled solutions should be the ability to make a decision/respond faster and as accurately as a human, provided the solutions have adequate reliability and safety assurances. To realize a strategic shift requires a broader adoption of the risk tolerant approach to adopting AI enabled technologies when they reach these minimum thresholds.

The Commission Staff will:

- Work with the writing team to transition the research memo into the interim report. (Action: Staff)
- Share a draft of the interim report by September 27th and organize a call with Commissioners for their feedback the following week. (Action: Staff)
- Work with Commissioner McFarland to identify key acquisition-focused recommendations. (Action: Ms. McFarland, Staff)
- Identify areas for further research and assessment during the Commission's next phase. (Action: Staff)



Working Group on Preparing Our National Security Workforce for an AI Future

Summary of Conclusions

NSCAI Offices In-Person Meeting #3 | September 9, 2019 | 0830 - 1700

Working Group Objective: Determine the current status of the AI workforce and recommend concrete steps the United States should take to build and maintain an AI workforce that can address national security and defense needs of the United States.

Working Group Approach: Through a comprehensive analysis and assessment of the U.S. national security AI workforce, develop recommendations to maintain U.S. leadership through AI in the national security apparatus, to include:

- Assessment of the current AI workforce
- Defining the role of the AI workforce
- Developing and recruiting an AI workforce
- AI talent management
- Mechanisms for implementation

Meeting Objective:

Assess and identify recruitment and hiring practices and create an interagency workforce framework.

Commissioners in Attendance:

- Dr. Jose-Marie Griffiths
- Dr. Bill Mark
- Ms. Mignon Clyburn

Commissioners Discussed:

- How scholarships, internships, and fellowships can attract AI talent to the USG
- The hiring authorities and pay scales the government uses to attract STEM talent in general and AI talent in particular
- How cultural issues, particularly within human resources, hinder the recruitment and retention of AI talent
- How technical integrators and other traditionally structured companies hire, train, and model their AI workforce, particularly regarding the use of hub and spoke models and compensation
- How might NSCAI, the Defense Innovation Board, and the Joint Artificial Intelligence Center agree to a common framework for the USG AI workforce
- Draft recommendations based on findings from the first two working group sessions



The Commissioners Agreed:

- Organizational structure is as important as recruitment, upskilling, and the number of experts in a team.
- The government needs to increase opportunities for AI practitioners to cross-collaborate on projects.
- The Commission needs to acknowledge that there's a land rush for AI talent, and while the government can become more competitive using existing hiring authorities, it is unlikely to compete effectively via financial compensation. The government has other recruiting mechanisms like scholarships and the value of public service, both as a career investment and as a contribution to the public good, that can compete if used intelligently.
- The government needs to establish hubs for data science and AI/ML expertise that will help drive change into spokes and sustain it, disseminate results and methods, connect practitioners, increase awareness of efforts, and manage talent.
- Cultural issues, slow onboarding, and risk-averse human resource practices hold up progress as much as technical issues.

The Commissioners Next Steps include:

- More precisely define the national security departments and agencies.
- Continuing addressing workforce and organizational structure issues while beginning to shift focus towards immigration and education issues. Education issues will include K-12, undergraduate, and graduate levels, and will address diversity challenges in the AI/ML workforce.

The Commission Staff will:

- Update the research memo to incorporate commissioner feedback. This includes highlighting areas of commissioner consensus, follow on research, and adjusting recommendations as indicated during the working group session.
- Update the workforce framework with illustrative examples of job titles falling within each archetype.
- Continue engaging DIB and JAIC about the joint workforce framework, and will provide the commissioners an update no later than September 19.
- Regularly provide updates and seek guidance from commissioners about immigration and education research, including an initial assessment of high skill immigration and the state of literature about AI/ML education.