Gov't Shows Expanded Commitment To AI Development

By **Tina Reynolds** (February 22, 2019, 4:51 PM EST)

By all accounts 2019 will bring significant expansion in the use and development of artificial intelligence by the U.S. federal government. Notwithstanding some well-publicized rejections by industry[1] of the use of their AI technologies for offensive military and surveillance applications, the federal government remains a major supporter of and customer for AI technologies. Below we outline some of the current federal government players in the AI space and their plans for the coming year.

DARPA

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The Defense Advanced Research Projects Agency, or DARPA, is the research arm of the U.S. Department of Defense, initially developed to compete with the Soviet Union's technological developments in the Cold War era. Through a combination of innovative contracting methods and cooperative efforts, DARPA aims to include non-traditional defense contractors in the development of technologies with potential military applications.

DARPA's involvement in AI began in the 1960s, with a focus on rule-based systems performing narrowly defined tasks. In the 1990s, AI expanded to include machine learning, which enabled analysis of large amounts of data, leading to important commercial and government applications. In fact, some of the first successes in AI were funded by DARPA, including the development of expert systems and search capabilities and advances in machine learning algorithms.

In July 2018, DARPA announced the establishment of its Artificial Intelligence Exploration, or AIE, program,[2] which will utilize unique funding opportunities and streamlined contracting procedures to explore the feasibility of new AI concepts within 18 months with a goal of spurring major AI breakthroughs. AIE awards of up to $1 million will be described in the issued AIE opportunities to be published on the FedBizOpps website[3] under Program Announcement DARPA-PA-18-02.

DARPA also announced a multi-year investment in its new "AI Next[4] campaign, which will set aside more than $2 billion to address AI needs. Among the goals of AI Next are automation of critical DOD business processes including security clearance vetting and software accreditation, enhancing machine learning security and reliability, and developing the next generation "third wave" of AI. With AI Next, DARPA has announced its intention to move beyond "first wave" — rule-based — and "second wave" — statistical learning-based — AI to a new "third wave" of AI theory and applications that involve

contextual adaptation utilizing models to explain and drive decision-making. This third wave of AI will address some of the limitations of the prior wave technologies and enable AI to adapt to changing situations.

In March 2019, DARPA will host an AI colloquium[5] that will bring together leaders in the DOD and across industry to explore how AI technologies can apply to military missions.

IARPA

The Intelligence Advanced Research Projects Activity, or IARPA, is planning two upcoming AI-related programs. The first, called "Secure, Assured, Intelligent Learning Systems," or SAILS,[6] is designed to explore ways to prevent attackers from revealing personally identifiable information contained in training data and statistical information used to train AI systems. With SAILS, IARPA seeks ways to protect personal privacy by making machine learning algorithms less vulnerable to reverse engineering that reveals underlying data.

A second IARPA project, called TrojAI,[7] aims to combat "Trojan horse" attacks, in which an attacker attempts to confuse or disrupt an intelligent system by injecting false data into a training data set. For example, if an attacker injects fraudulent or distorted images of stop signs into the algorithms that teach self-driving vehicles to recognize stop signs using images containing the signs, the algorithm may fail to recognize certain stop signs in the real world, potentially putting lives at risk. TrojAI aims to develop software that can scan the output of an algorithm to determine whether the algorithm has been attacked in this manner.

National Science Foundation

The National Science Foundation, a federal agency that supports fundamental research and education in all the non-medical fields of science and engineering, has a long history of supporting AI research. The NSF is uniquely positioned to bring together various disciplines, including mathematics, computer science, engineering, cognitive science, psychology and linguistics to coordinate in the enhancement of AI capabilities. The NSF has a number of funding opportunities[8] to support AI research. For example, the NSF is currently supporting EArly-concept Grants for Exploratory Research,[9] or EAGERs, to examine and understand the social challenges arising from AI technology and ways to overcome those challenges. NSF recognizes that AI is only useful to the extent that the public embraces and accepts the technology.

The White House

In late 2016, the Obama administration published the first U.S. strategic plan for AI research and development,[10] which outlined funding priorities for the federal government. Following this lead, the Trump administration has taken additional steps to develop an AI strategy. The White House hosted a May 2018 conference[11] of government officials, industry leaders and academia at which the attendees discussed "the promise of AI" and identified the policies needed to encourage AI innovation in the United States. Industry sectors represented at the summit included food and agriculture, energy and manufacturing, financial services, healthcare, and transportation and logistics. President Donald Trump's FY2019 Budget Request was the first to designate artificial intelligence and autonomous and unmanned systems as administration research and development priorities.[12]

In mid-February 2019, President Trump issued a new executive order[13] on maintaining U.S. leadership

in the field of AI. The order recognizes the essential role of the federal government in advancing AI research and development, promoting the trust of the American people in AI, training the U.S. workforce in AI and protecting U.S. companies' AI technology from competitors and nation states seeking to access technology by improper means. To accomplish these goals, the order announced the plan for a coordinated federal government strategy, the American AI Initiative. The initiative is to be coordinated by the National Science and Technology Council Select Committee on Artificial Intelligence, and implemented by those federal agencies — like DARPA, IARPA and the NSF — that conduct foundational AI research and development, develop and deploy applications of AI technologies, provide educational grants, and regulate and provide guidance for applications of AI technologies.

In sum, the foundational principles are in place to encourage a major expansion in federal AI-related research and development, and adoption of AI technologies. It remains to be seen precisely how readily a shift to AI will take place. In the near term, companies seeking to further develop AI technologies should consider partnering with the federal government to take advantage of the availability of federal funding and the current buzz around all things AI.

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[1] https://www.axios.com/power-shift-artificial-intelligence-funding-government-51f9a28a-0da5-4787-b84f-a69c9b9c92da.html.

[2] https://www.darpa.mil/news-events/2018-07-20a.

[3] https://www.fbo.gov/index?s=opportunity&mode=form&id=4d1714a70aed75b0176be12e70de22f9&tab=core&_cview=1.

[4] https://www.darpa.mil/work-with-us/ai-next-campaign.

[5] https://www.darpa.mil/news-events/artificial-intelligence-colloquium.

[6] https://www.iarpa.gov/index.php/research-programs/sails.

[7] https://www.iarpa.gov/index.php?option=com_content&view=article&id=1142&Itemid=443

[8] https://www.nsf.gov/funding/pgm_list.jsp?ord=rcnt&org=nsf.

[9] https://www.nsf.gov/pubs/2019/nsf19018/nsf19018.jsp.

[10] https://www.nitrd.gov/PUBS/national_ai_rd_strategic_plan.pdf.

[11] https://www.whitehouse.gov/wp-content/uploads/2018/05/Summary-Report-of-White-House-AI-Summit.pdf.

[12] https://www.whitehouse.gov/wp-content/uploads/2018/02/ap_18_research-fy2019.pdf.

[13] https://www.whitehouse.gov/presidential-actions/executive-order-maintaining-american-leadership-artificial-intelligence/.