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Preparing for the Future of Artificial Intelligence (Agency Report)

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Surveys the current status of Artificial Intelligence, identifies challenges in its application and provides recommendations for federal agencies and practitioners to advance the technology, promote innovation, and benefit the public.

SCITALK

POLICY PROGRESS

The Policy

Synopsis

The report “Preparing for the Future of Artificial Intelligence”, prepared by the National Science and Technology Council (NSTC), surveys the current state of artificial intelligence (AI) research, including current and potential applications, and identifies questions that progress in AI raises for society and public policy. The report also makes recommendations for further AI-related actions by federal agencies. In the context of this report, AI refers to computerized systems that are capable of rationally solving complex real-world problems or taking appropriate actions to achieve a set of goals.

To accommodate the current landscape and address challenges for AI, the report makes 23 recommendations organized into eight topic areas. These recommendations name specific actions federal agencies and other government entities could take that are intended to expand AI research and application, investigate AI’s economic and social impact, and monitor its safety, security, and fairness. The recommendations within each topic area are as follows:

Applications of AI for Public Good – To foster beneficial applications of AI in both public and private sectors:

Private and public institutions are encouraged to investigate approaches to responsibly leverage AI and machine learning to benefit society; and

The federal government should prioritize open training data (i.e., datasets used to discover potential predictive relationships in machine learning applications) to accelerate AI research and promote open data standards and best practices in Federal agencies.

AI in the Federal Government – To promote the use of AI in government to serve the public faster, more effectively and at lower cost, the Federal government should:

Improve the capacity of key agencies to apply AI to their missions; and

Develop a community of practice for AI practitioners across agencies to work together, share standards, and include AI opportunities in federal training programs when appropriate.

AI and Regulation – While developing and adapting regulatory policy regarding AI, agencies should:

Draw on appropriate technical expertise at the senior level;

Use the full range of personnel assignment and exchange models to foster a federal workforce with diverse perspectives on the current state of AI;

Work with industry and researchers through the Department of Transportation to increase sharing of data for safety, research, and other purposes;

Invest in the development and implementation of an advanced and automated air traffic management system that fully accommodates both piloted and autonomous (i.e., self-flying) aircraft; and

Continue developing an evolving regulatory framework to enable the safe integration of fully automated (i.e., self-driving or driverless) vehicles and autonomous aircraft into the transportation system.

Research and Workforce – To support basic research (i.e., research intended to expand knowledge or interest in a scientific question) and applications of AI to benefit the public good and develop a skilled and diverse workforce:

The NSTC Subcommittee on Machine Learning and Artificial Intelligence (MLAI) should monitor developments in AI and report status updates regularly to senior administration leadership, especially with regard to domestic and international milestones;

The government should monitor the state of AI milestones in other countries;

Industry should update the government on general progress of AI in industry;

The federal government should prioritize basic and long-term AI research; and

NSTC subcommittee on MLAI and the Networking and Information Technology Research and Development program should work with NSTC Committee on Science, Technology, Engineering and Math Education (CoSTEM) on initiating study on the AI workforce pipeline to develop actions that ensure appropriate increases in its size, quality and diversity.

AI, Automation and the Economy – To understand the potential impacts of AI on the economy and put policies and institutions in place to support the benefits of AI while mitigating the costs:

The Executive Office of President should publish a follow-up report ("Artificial Intelligence, Automation and the Economy") by the end of 2016 to investigate the effects of AI and automation on the US job market and to outline recommended economic policy.

Fairness, Safety and Governance – To monitor the safety and fairness of AI applications for public protection:

Federal agencies using AI-based systems to make or provide decision support for consequential decisions about individuals should ensure efficacy and fairness based on evidence-based verification and validation;

Federal agencies providing grants to state and local government for the application of AI-based systems that will make consequential decisions about individuals should ensure that AI-based products or services purchased with Federal funding produce results in a sufficiently transparent fashion and are supported by efficacy and fairness;

Educational institutions should include ethics, security, privacy, and safety as integral parts of their AI curriculum; and

AI professionals and safety professionals should collaborate toward developing a mature field of AI safety engineering.

Global Considerations and Security – While developing AI policy questions with regards to international relations, cyber security, and defense, the federal government should:

Develop a government-wide strategy on international engagement related to AI and develop a list of AI topic areas that need international engagement and monitoring;

Deepen its engagement with key international stakeholders to exchange information and facilitate collaboration on AI research and development;

Ensure agencies' plans and strategies to account for the mutual influence of AI and cyber-security; and

Develop a single, government-wide policy on autonomous and semi-autonomous weapons that is consistent with international humanitarian law.

Context

The Report was developed by the NSTC's Subcommittee on Machine Learning and Artificial Intelligence, which was chartered in May 2016. The Report was reviewed by the NSTC Committee on Technology.

OSTP led a series of public outreach activities to engage with experts and the general public to acquire information for the report. The events included:

AI, Law, and Policy (May 24, 2016);

AI for Social Good (June 7, 2016);

Future of AI: Emerging Topics and Societal Benefit at the Global Entrepreneurship Summit (June 23, 2016);

AI Technology, Safety, and Control (June 28, 2016); and

Social and Economic Impacts of AI (July 7, 2016).

In June 2016, the Office of Science and Technology Policy (OSTP) published a Request for Information (RFI)to solicit feedback on overarching questions and proposed solutions in emerging AI research. The submitted comments were published by OSTP on September 6, 2016.