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U.S. GOVERNMENT
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116TH CONGRESS
1ST SESSION

S. 143

To authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purposes.

IN THE SENATE OF THE UNITED STATES

JANUARY 16, 2019

Ms. ERNST (for herself, Ms. HASSAN, Mr. PORTMAN, Mr. GARDNER, Mr. KING, and Mr. HEINRICH) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To authorize the Department of Energy to conduct collaborative research with the Department of Veterans Affairs in order to improve healthcare services for veterans in the United States, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Department of Energy Veterans' Health Initiative Act".

SEC. 2. DEFINITIONS.

In this Act:

(1) DEPARTMENT.—The term ''Department'' means the Department of Energy.

(2) NATIONAL LABORATORY.—The term ''National Laboratory'' has the meaning given that term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(3) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

SEC. 3. PURPOSES.

The purposes of this Act are to advance Department of Energy expertise in artificial intelligence and high-performance computing in order to improve health outcomes for veteran populations by—

(1) supporting basic research through the application of artificial intelligence, high-performance computing, modeling and simulation, machine learning, and large scale data analytics to identify and solve outcome-defined challenges in the health sciences;

(2) maximizing the impact of the Department of Veterans Affairs' health and genomics data housed at the National Laboratories, as well as data from other sources, on science, innovation, and health care outcomes through the use and advance-

ment of artificial intelligence and high-performance computing capabilities of the Department of Energy;

(3) promoting collaborative research through the establishment of partnerships to improve data sharing between Federal agencies, National Laboratories, institutions of higher education, and non-profit institutions;

(4) establishing multiple scientific computing user facilities to house and provision available data to foster transformational outcomes; and

(5) driving the development of technology to improve artificial intelligence, high-performance computing, and networking relevant to mission applications of the Department of Energy, including modeling, simulation, machine learning, and advanced data analytics.

SEC. 4. DEPARTMENT OF ENERGY VETERANS HEALTH RESEARCH AND DEVELOPMENT.

(a) IN GENERAL.—The Secretary shall establish and carry out a research program in artificial intelligence and high-performance computing, focused on the development of tools to solve big data challenges associated with veteran's healthcare, and to support the efforts of the Department of Veterans Affairs to identify potential health risks and challenges utilizing data on long-term health-

care, health risks, and genomic data collected from veteran populations. The Secretary shall carry out this program through a competitive, merit-reviewed process, and consider applications from National Laboratories, institutions of higher education, multi-institutional collaborations, and other appropriate entities.

(b) PROGRAM COMPONENTS.—In carrying out the program established under subsection (a), the Secretary may—

(1) conduct basic research in modeling and simulation, machine learning, large scale data analytics, and predictive analysis in order to develop novel or optimized algorithms for prediction of disease treatment and recovery;

(2) develop methods to accommodate large data sets with variable quality and scale, and to provide insight and models for complex systems;

(3) develop new approaches and maximize the use of algorithms developed through artificial intelligence, machine learning, data analytics, natural language processing, modeling and simulation, and develop new algorithms suitable for high-performance computing systems and large biomedical data sets;

(4) advance existing and construct new data enclaves capable of securely storing data sets provided by the Department of Veterans Affairs, Department of Defense, and other sources; and

(5) promote collaboration and data sharing between National Laboratories, research entities, and user facilities of the Department by providing the necessary access and secure data transfer capabilities.

(c) COORDINATION.—In carrying out the program required under subsection (a), the Secretary is authorized to—

(1) enter into memoranda of understanding in order to carry out reimbursable agreements with the Department of Veterans Affairs and other entities in order to maximize the effectiveness of Department of Energy research and development to improve veterans' healthcare;

(2) consult with the Department of Veterans Affairs and other Federal agencies as appropriate; and

(3) ensure that data storage meets all privacy and security requirements established by the Department of Veterans Affairs, and that access to data is provided in accordance with relevant Department of

Veterans Affairs data access policies, including informed consent.

(d) REPORT.—Not later than two years after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology and the Committee on Veterans' Affairs of the House of Representatives, and the Committee on Energy and Natural Resources and the Committee on Veterans' Affairs of the Senate, a report detailing the effectiveness of—

(1) the interagency coordination between each Federal agency involved in the research program carried out under this section;

(2) collaborative research achievements of the program; and

(3) potential opportunities to expand the technical capabilities of the Department.

(e) FUNDING.—The Secretary of Veterans Affairs shall allocate up to $27,000,000 during the period of fiscal years 2019 through 2023 to carry out this section, subject to the availability of appropriations.

SEC. 5. ARTIFICIAL INTELLIGENCE, DATA ANALYTICS, AND COMPUTATIONAL RESEARCH PILOT PROGRAM.

(a) IN GENERAL.—The Secretary shall carry out a pilot program to develop tools for big data analytics by

utilizing data sets generated by Federal agencies, institutions of higher education, nonprofit research organizations, and industry in order to advance artificial intelligence technologies to solve complex, big data challenges. The Secretary shall carry out this program through a competitive, merit-reviewed process, and consider applications from National Laboratories, institutions of higher education, multi-institutional collaborations, and other appropriate entities.

(b) PROGRAM COMPONENTS.—In carrying out the pilot program established under subsection (a), the Secretary may—

(1) establish a cross-cutting research initiative to prevent duplication and coordinate research efforts in artificial intelligence and data analytics across the Department;

(2) conduct basic research in modeling and simulation, artificial intelligence, machine learning, large scale data analytics, natural language processing, and predictive analysis in order to develop novel or optimized predictive algorithms suitable for high-performance computing systems and large biomedical data sets;

(3) develop multivariate optimization models to accommodate large data sets with variable quality and scale in order to visualize complex systems;

(4) establish multiple scientific computing user facilities to serve as data enclaves capable of securely storing data sets created by Federal agencies, institutions of higher education, nonprofit organizations, or industry at National Laboratories; and

(5) promote collaboration and data sharing between National Laboratories, research entities, and user facilities of the Department by providing the necessary access and secure data transfer capabilities.

(c) REPORT.—Not later than two years after the date of the enactment of this Act, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report evaluating the effectiveness of the pilot program under subsection (a), including basic research discoveries achieved in the course of the program and potential opportunities to expand the technical capabilities of the Department through the development of artificial intelligence and data analytics technologies.

(d) FUNDING.—The Secretary of Energy shall allocate up to $26,000,000 for each of fiscal years 2019 and 2020 to carry out this section, subject to the availability of appropriations.

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