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.

1 *Be it enacted by the Senate and House of Representa-*

2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "Department of Energy

5 Veterans' Health Initiative Act".

6 **SEC. 2. DEFINITIONS.**

7 In this Act:

1   (1) DEPARTMENT.—The term "Department"

2   means the Department of Energy.

3   (2) NATIONAL LABORATORY.—The term "Na-

4   tional Laboratory" has the meaning given that term

5   in section 2 of the Energy Policy Act of 2005 (42

6   U.S.C. 15801).

7   (3) SECRETARY.—The term "Secretary" means

8   the Secretary of Energy.

9   **SEC. 3. PURPOSES.**

10   The purposes of this Act are to advance Department

11   of Energy expertise in artificial intelligence and high-per-

12   formance computing in order to improve health outcomes

13   for veteran populations by—

14   (1) supporting basic research through the appli-

15   cation of artificial intelligence, high-performance

16   computing, modeling and simulation, machine learn-

17   ing, and large scale data analytics to identify and

18   solve outcome-defined challenges in the health

19   sciences;

20   (2) maximizing the impact of the Department

21   of Veterans Affairs' health and genomics data

22   housed at the National Laboratories, as well as data

23   from other sources, on science, innovation, and

24   health care outcomes through the use and advance-

1 ment of artificial intelligence and high-performance

2 computing capabilities of the Department of Energy;

3   (3) promoting collaborative research through

4   the establishment of partnerships to improve data

5   sharing between Federal agencies, National Labora-

6   tories, institutions of higher education, and non-

7   profit institutions;

8   (4) establishing multiple scientific computing

9   user facilities to house and provision available data

10   to foster transformational outcomes; and

11   (5) driving the development of technology to im-

12   prove artificial intelligence, high-performance com-

13   puting, and networking relevant to mission applica-

14   tions of the Department of Energy, including mod-

15   eling, simulation, machine learning, and advanced

16   data analytics.

17 **SEC. 4. DEPARTMENT OF ENERGY VETERANS HEALTH RE-**

18   **SEARCH AND DEVELOPMENT.**

19 (a) IN GENERAL.—The Secretary shall establish and

20 carry out a research program in artificial intelligence and

21 high-performance computing, focused on the development

22 of tools to solve big data challenges associated with vet-

23 eran's healthcare, and to support the efforts of the De-

24 partment of Veterans Affairs to identify potential health

25 risks and challenges utilizing data on long-term health-

1 care, health risks, and genomic data collected from veteran

2 populations. The Secretary shall carry out this program

3 through a competitive, merit-reviewed process, and con-

4 sider applications from National Laboratories, institutions

5 of higher education, multi-institutional collaborations, and

6 other appropriate entities.

7 (b) PROGRAM COMPONENTS.—In carrying out the

8 program established under subsection (a), the Secretary

9 may—

10 (1) conduct basic research in modeling and sim-

11 ulation, machine learning, large scale data analytics,

12 and predictive analysis in order to develop novel or

13 optimized algorithms for prediction of disease treat-

14 ment and recovery;

15 (2) develop methods to accommodate large data

16 sets with variable quality and scale, and to provide

17 insight and models for complex systems;

18 (3) develop new approaches and maximize the

19 use of algorithms developed through artificial intel-

20 ligence, machine learning, data analytics, natural

21 language processing, modeling and simulation, and

22 develop new algorithms suitable for high-perform-

23 ance computing systems and large biomedical data

24 sets;

1   (4) advance existing and construct new data en-

2   claves capable of securely storing data sets provided

3   by the Department of Veterans Affairs, Department

4   of Defense, and other sources; and

5   (5) promote collaboration and data sharing be-

6   tween National Laboratories, research entities, and

7   user facilities of the Department by providing the

8   necessary access and secure data transfer capabili-

9   ties.

10   (c) COORDINATION.—In carrying out the program re-

11 quired under subsection (a), the Secretary is authorized

12 to—

13   (1) enter into memoranda of understanding in

14   order to carry out reimbursable agreements with the

15   Department of Veterans Affairs and other entities in

16   order to maximize the effectiveness of Department

17   of Energy research and development to improve vet-

18   erans' healthcare;

19   (2) consult with the Department of Veterans

20   Affairs and other Federal agencies as appropriate;

21   and

22   (3) ensure that data storage meets all privacy

23   and security requirements established by the Depart-

24   ment of Veterans Affairs, and that access to data is

25   provided in accordance with relevant Department of

1 Veterans Affairs data access policies, including in-
2 formed consent.

3 (d) REPORT.—Not later than two years after the date
4 of the enactment of this Act, the Secretary shall submit
5 to the Committee on Science, Space, and Technology and
6 the Committee on Veterans' Affairs of the House of Rep-
7 resentatives, and the Committee on Energy and Natural
8 Resources and the Committee on Veterans' Affairs of the
9 Senate, a report detailing the effectiveness of—

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

13   (2) collaborative research achievements of the
14   program; and

15   (3) potential opportunities to expand the tech-
16   nical capabilities of the Department.

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

21 **SEC. 5. ARTIFICIAL INTELLIGENCE, DATA ANALYTICS, AND**
22   **COMPUTATIONAL RESEARCH PILOT PRO-**
23   **GRAM.**

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

1 utilizing data sets generated by Federal agencies, institu-

2 tions of higher education, nonprofit research organiza-

3 tions, and industry in order to advance artificial intel-

4 ligence technologies to solve complex, big data challenges.

5 The Secretary shall carry out this program through a com-

6 petitive, merit-reviewed process, and consider applications

7 from National Laboratories, institutions of higher edu-

8 cation, multi-institutional collaborations, and other appro-

9 priate entities.

10 (b) PROGRAM COMPONENTS.—In carrying out the

11 pilot program established under subsection (a), the Sec-

12 retary may—

13   (1) establish a cross-cutting research initiative

14   to prevent duplication and coordinate research ef-

15   forts in artificial intelligence and data analytics

16   across the Department;

17   (2) conduct basic research in modeling and sim-

18   ulation, artificial intelligence, machine learning,

19   large scale data analytics, natural language proc-

20   essing, and predictive analysis in order to develop

21   novel or optimized predictive algorithms suitable for

22   high-performance computing systems and large bio-

23   medical data sets;

1   (3) develop multivariate optimization models to

2   accommodate large data sets with variable quality

3   and scale in order to visualize complex systems;

4   (4) establish multiple scientific computing user

5   facilities to serve as data enclaves capable of se-

6   curely storing data sets created by Federal agencies,

7   institutions of higher education, nonprofit organiza-

8   tions, or industry at National Laboratories; and

9   (5) promote collaboration and data sharing be-

10   tween National Laboratories, research entities, and

11   user facilities of the Department by providing the

12   necessary access and secure data transfer capabili-

13   ties.

14   (c) REPORT.—Not later than two years after the date

15 of the enactment of this Act, the Secretary shall submit

16 to the Committee on Science, Space, and Technology of

17 the House of Representatives and the Committee on En-

18 ergy and Natural Resources of the Senate a report evalu-

19 ating the effectiveness of the pilot program under sub-

20 section (a), including basic research discoveries achieved

21 in the course of the program and potential opportunities

22 to expand the technical capabilities of the Department

23 through the development of artificial intelligence and data

24 analytics technologies.

1   (d) FUNDING.—The Secretary of Energy shall allo-
2 cate up to $26,000,000 for each of fiscal years 2019 and
3 2020 to carry out this section, subject to the availability
4 of appropriations.

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