

Substitute



AMENDMENT NO. \_\_\_\_\_ Calendar No. \_\_\_\_\_

Purpose: In the nature of a substitute.

**IN THE SENATE OF THE UNITED STATES—116th Cong., 2d Sess.**

**S. 3891**

To require the Director of the National Institute of Standards and Technology to advance the development of technical standards for artificial intelligence, to establish the National Program to Advance Artificial Intelligence Research, to promote research on artificial intelligence at the National Science Foundation, and for other purposes.

Referred to the Committee on \_\_\_\_\_ and  
ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT IN THE NATURE OF A SUBSTITUTE intended  
to be proposed by Mr. GARDNER

Viz:

- 1 Strike all after the enacting clause and insert the fol-
- 2 lowing:
- 3 **SECTION 1. SHORT TITLE.**
- 4 This Act may be cited as the “Advancing Artificial
- 5 Intelligence Research Act of 2020”.

1 **SEC. 2. STANDARD DEVELOPMENT FOR ARTIFICIAL INTEL-**  
2 **LIGENCE AT THE NATIONAL INSTITUTE OF**  
3 **STANDARDS AND TECHNOLOGY.**

4 The National Institute of Standards and Technology  
5 Act (15 U.S.C. 271 et seq.) is amended by inserting after  
6 section 22 the following:

7 **“SEC. 22A. STANDARDS FOR ARTIFICIAL INTELLIGENCE.**

8 “(a) MISSION.—The Institute shall—

9 “(1) have the mission of advancing collaborative  
10 frameworks, standards, guidelines, and associated  
11 methods and techniques for artificial intelligence;

12 “(2) support the development of a risk-mitiga-  
13 tion framework for deploying artificial intelligence;

14 “(3) support the development of technical  
15 standards and guidelines that promote reliable, ro-  
16 bust, and trustworthy artificial intelligence; and

17 “(4) support the development of technical  
18 standards and guidelines by which to test for bias in  
19 artificial intelligence training data and applications.

20 “(b) PARTICIPATION IN STANDARD SETTING ORGA-  
21 NIZATIONS.—

22 “(1) REQUIREMENT.—The Institute shall par-  
23 ticipate in the development of standards and speci-  
24 fications for artificial intelligence.

1           “(2) PURPOSE.—The purpose of participation  
2 of the Institute under paragraph (1) shall be to en-  
3 sure—

4                   “(A) that standards promote artificial in-  
5 telligence that is reliable, robust, and trust-  
6 worthy; and

7                   “(B) that standards relating to artificial  
8 intelligence reflect the state of technology and  
9 are fit-for-purpose and developed in the trans-  
10 parent and consensus-based processes that are  
11 open to all stakeholders.”.

12 **SEC. 3. ESTABLISHMENT OF NATIONAL PROGRAM TO AD-**  
13 **VANCE ARTIFICIAL INTELLIGENCE RE-**  
14 **SEARCH.**

15       The National Institute of Standards and Technology  
16 Act (15 U.S.C. 271 et seq.), as amended by section 2,  
17 is further amended by inserting after section 22A the fol-  
18 lowing:

19 **“SEC. 22B. NATIONAL PROGRAM TO ADVANCE ARTIFICIAL**  
20 **INTELLIGENCE RESEARCH.**

21       “(a) ESTABLISHMENT.—

22                   “(1) IN GENERAL.—The Director shall establish  
23 a research program with a national scope to advance  
24 use-inspired artificial intelligence research and its  
25 use in a manner that serves the needs of the United

1 States, the Institute, industry, the academic commu-  
2 nity, and such other entities as the Director con-  
3 siders appropriate.

4 “(2) DESIGNATION.—The research program es-  
5 tablished under paragraph (1) shall be known as the  
6 ‘National Program to Advance Artificial Intelligence  
7 Research’ (in this section referred to as the ‘Pro-  
8 gram’).

9 “(b) ACTIVITIES.—The activities of the Program  
10 shall include the following:

11 “(1) Supporting research necessary to opera-  
12 tionalize the goals of reliable, robust, and trust-  
13 worthy artificial intelligence.

14 “(2) Supporting research necessary to develop  
15 and operationalize standards and guidelines that  
16 promote reliable, robust, and trustworthy artificial  
17 intelligence.

18 “(3) Fostering development of artificial intel-  
19 ligence applications that would enhance the public  
20 good.

21 “(4) Supporting research necessary to advance  
22 human-centered artificial intelligence and examining  
23 societal, ethical, safety, security, and privacy effects  
24 of artificial intelligence development and deployment.

1           “(5) Creating and developing processes for the  
2           purpose of advancing use-inspired artificial intel-  
3           ligence research and its use.

4           “(6) Promoting exchange of personnel among  
5           industry, academic, and the government entities.

6           “(7) Promoting the appropriate access to Fed-  
7           eral Government data, including—

8                   “(A) developing standards for protecting  
9                   privacy; and

10                   “(B) making the data machine readable.

11           “(8) Establishing and operating at least one  
12           test bed to support the outside entities testing the  
13           degree to which artificial intelligence applications  
14           and training data are reliable, robust, and trust-  
15           worthy.

16           “(c) GEOGRAPHIC DISTRIBUTION.—In establishing  
17           the Program, the Director may establish multiple physical  
18           campuses and a national network of participants to avoid  
19           undue geographic concentration of the activities of the  
20           Program.

21           “(d) AUTHORIZATION OF APPROPRIATIONS.—There  
22           is authorized to be appropriated to carry out this section  
23           \$250,000,000 for each of fiscal years 2021 through  
24           2025.”.

1 **SEC. 4. ESTABLISHMENT OF NATIONAL ARTIFICIAL INTEL-**  
2 **LIGENCE RESEARCH INSTITUTES.**

3 (a) ESTABLISHMENT.—

4 (1) IN GENERAL.—The Director of the National  
5 Science Foundation shall establish at least 6 re-  
6 search institutes to serve the needs of the United  
7 States, industry, the academic community, and such  
8 other entities as the Director considers appropriate  
9 by—

10 (A) conducting research on enduring chal-  
11 lenges in use-inspired artificial intelligence re-  
12 search; and

13 (B) creating and developing processes for  
14 the purpose of advancing use-inspired artificial  
15 intelligence research and its deployment.

16 (2) DESIGNATION.—Each research institute es-  
17 tablished under paragraph (1) shall be known as a  
18 “National Artificial Intelligence Research Institute”.

19 (b) GRANTS.—

20 (1) IN GENERAL.—The Director shall establish  
21 the research institutes under subsection (a) through  
22 the award of grants to eligible entities using a com-  
23 petitive, merit-reviewed process.

24 (2) ELIGIBLE ENTITIES.—For purposes of this  
25 section, an eligible entity is—

26 (A) an institution of higher education;

1 (B) a nonprofit research center;

2 (C) such other type of entity as the Direc-  
3 tor considers appropriate; or

4 (D) a collaboration of any combination of  
5 entities described in subparagraphs (A) through  
6 (C).

7 (3) DURATION.—

8 (A) IN GENERAL.—Each grant awarded  
9 under paragraph (1) shall be for a period of 5  
10 years.

11 (B) REAPPLICATION.—The Director may  
12 approve or disapprove reapplications from grant  
13 recipients for additional grants.

14 (C) TERMINATION.—The Director may ter-  
15 minate a grant awarded under paragraph (1)  
16 for an underperforming research institute, for  
17 cause, during the performance period of the  
18 grant.

19 (c) APPLICATIONS.—An eligible entity seeking a  
20 grant under paragraph (1) to establish a research institute  
21 under this section shall submit to the Director an applica-  
22 tion therefor at such time, in such manner, and containing  
23 such information as the Director determines appropriate.

24 (d) PARTNERSHIPS.—In considering an application  
25 submitted under subsection (c), the Director shall consider

1 applications that support partnerships among institutions  
2 of higher education and industry that facilitate collabo-  
3 rative research, personnel exchanges, and workforce devel-  
4 opment with respect to artificial intelligence and artificial  
5 intelligence engineering.

6 (e) COMMUNITY FACILITY.—The Director shall en-  
7 sure that at least 1 research institute established under  
8 this section operates an artificial-intelligence community  
9 computing facility that is available for use by entities  
10 other than research institutes established under this sec-  
11 tion.

12 (f) CLOUD INFRASTRUCTURE.—In carrying out this  
13 section, the Director may, as the Director considers appro-  
14 priate, support cloud infrastructure.

15 (g) FUNDING.—

16 (1) IN GENERAL.—Subject to the availability of  
17 appropriations, the Director may, in each of fiscal  
18 years 2021 through 2025, obligate to carry out this  
19 section an amount that is less than or equal to  
20 \$50,000,000 multiplied by the number of research  
21 institutes established under this section.

22 (2) DERIVATION OF FUNDS.—Amounts obli-  
23 gated to carry out this section shall be derived from  
24 amounts appropriated to the Foundation.



1 **SEC. 5. NATIONAL SCIENCE FOUNDATION TRAINEESHIP**  
2 **PROGRAM GRANTS.**

3 (a) PROGRAM REQUIRED.—

4 (1) IN GENERAL.—The Director of the National  
5 Science Foundation shall carry out a program to  
6 award grants to eligible entities to establish train-  
7 eeship programs and support trainees in topics se-  
8 lected by the Director under subsection (c).

9 (2) PURPOSE.—The purpose of the program es-  
10 tablished by the Director under paragraph (1) shall  
11 be to increase the number of individuals with ad-  
12 vanced degrees through both direct support and pro-  
13 grammatic support.

14 (b) ELIGIBLE ENTITIES.—For purposes of this sec-  
15 tion, an eligible entity is—

16 (1) an institution of higher education; or

17 (2) a consortia of institutions of higher edu-  
18 cation or nonprofit organizations.

19 (c) TOPICS OF NATIONAL IMPORTANCE.—

20 (1) IN GENERAL.—Subject to paragraph (2),  
21 the Director shall select a topic for the award of  
22 grants under subsection (a) based on—

23 (A) the potential of a traineeship program  
24 in the topic or support of trainees in the topic  
25 to affect society positively;

1 (B) the importance of the topic to the  
2 economy and security of the United States;

3 (C) the career opportunities for the grad-  
4 uates; and

5 (D) the need for workers in the topic with  
6 advanced degrees.

7 (2) INITIAL TOPIC SELECTION.—The Director  
8 shall select artificial intelligence as the initial topic  
9 for the award of grants under subsection (a).

10 (d) COMPONENTS.—A grant awarded under this sec-  
11 tion may include support for—

12 (1) the recipient of the grant to develop and  
13 distribute model curriculum that may be used by  
14 other graduate programs to educate students in the  
15 topic selected under subsection (c);

16 (2) mentors to provide guidance for students  
17 within the topic area; and

18 (3) tuition and stipend for students pursuing a  
19 masters or doctoral degree.

20 **SEC. 6. NATIONAL SCIENCE FOUNDATION PILOT PROGRAM**  
21 **ON GRANTS FOR RESEARCH IN RAPIDLY**  
22 **EVOLVING, HIGH PRIORITY TOPICS.**

23 (a) PILOT PROGRAM REQUIRED.—The Director of  
24 the National Science Foundation shall establish a pilot  
25 program to assess the feasibility and advisability of award-

1 ing grants for the conduct of research in rapidly evolving,  
2 high priority topics.

3 (b) DURATION.—

4 (1) IN GENERAL.—The Director shall carry out  
5 the pilot program required by subsection (a) during  
6 the 5-year period beginning on the date of the enact-  
7 ment of this Act.

8 (2) ASSESSMENT AND CONTINUATION AUTHOR-  
9 ITY.—After the period set forth in paragraph (1)—

10 (A) the Director shall assess the pilot pro-  
11 gram; and

12 (B) if the Director determines that it is  
13 both feasible and advisable to do so, the Direc-  
14 tor may continue the pilot program.

15 (c) GRANTS.—In carrying out the pilot program, the  
16 Director shall award grants for the conduct of research  
17 in topics selected by the Director in accordance with sub-  
18 section (d).

19 (d) TOPIC SELECTION.—The Director shall select  
20 topics for research under the pilot program in accordance  
21 with the following:

22 (1) The Director shall select artificial intel-  
23 ligence as the initial topic for the pilot program.

24 (2) The Director may select additional topics  
25 that the Director determines are—

1 (A) rapidly evolving; or

2 (B) of high importance to the economy and  
3 security of the United States.

4 (e) APPLICATIONS.—

5 (1) IN GENERAL.—Subject to paragraph (2), a  
6 person seeking a grant under the pilot program shall  
7 submit to the Director an application therefor at  
8 such time, in such manner, and containing such in-  
9 formation as the Director may specify.

10 (2) CONTENTS.—Each application submitted  
11 under paragraph (1) shall include the following:

12 (A) A brief description of the research the  
13 applicant proposes to carry out with a grant  
14 awarded under the pilot program.

15 (B) A brief description of how the research  
16 is of an urgent nature.

17 (C) The general goals of the research.

18 (D) Such other information as the Director  
19 may specify.

20 (f) USE OF FUNDS.—A recipient of a grant under  
21 the pilot program shall use the amount of the grant to  
22 conduct the research for which the grant was awarded.

23 (g) SUMMARIES OF RESEARCH FINDINGS.—A recipi-  
24 ent of a grant under the pilot program shall submit to  
25 the Director, at such intervals as the Director determines

- 1 appropriate, a summary of the findings of the recipient
- 2 with respect to the research conducted with the grant
- 3 amount.