118TH CONGRESS
2D SESSION

S. _____

To authorize the Director of the National Science Foundation to identify grand challenges and award competitive prizes for artificial intelligence research and development.

_____

IN THE SENATE OF THE UNITED STATES

_____

Mr. BOOKER (for himself, Mr. ROUNDS, and Mr. HEINRICH) introduced the following bill; which was read twice and referred to the Committee on

_____

_____

A BILL

To authorize the Director of the National Science Foundation to identify grand challenges and award competitive prizes for artificial intelligence research and development.

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 "AI Grand Challenges

5 Act of 2024".

1 **SEC. 2. PRIZE COMPETITIONS FOR ARTIFICIAL INTEL-**

2   **LIGENCE RESEARCH AND DEVELOPMENT.**

3   (a) DEFINITION.—Except as otherwise expressly pro-

4 vided, in this section the term ''Director'' means the Di-

5 rector of the National Science Foundation.

6   (b) ESTABLISHMENT OF PROGRAM.—

7   (1) IN GENERAL.—Not later than 12 months

8   after the date of enactment of this Act, the Director,

9   in coordination with the Interagency Committee es-

10   tablished under section 5103 of the National Artifi-

11   cial Intelligence Initiative Act of 2020 (15 U.S.C.

12   9413), shall establish a program to award prizes,

13   utilizing the authorities and processes established

14   under section 24 of the Stevenson-Wydler Tech-

15   nology Innovation Act of 1980 (15 U.S.C. 3719), to

16   eligible participants as determined by the Director

17   pursuant to subsection (e) to stimulate artificial in-

18   telligence research, development, and commercializa-

19   tion that solves or advances specific, well-defined,

20   and measurable grand challenges in 1 or more of the

21   following categories:

22   (A) National security.

23   (B) Cybersecurity.

24   (C) Health.

25   (D) Energy.

26   (E) Environment.

1   (F) Transportation.

2   (G) Agriculture and rural development.

3   (H) Education and workforce training.

4   (I) Manufacturing.

5   (J) Space and aerospace.

6   (K) Quantum computing, including molec-

7   ular modeling and simulation.

8   (L) Materials science.

9   (M) Supply chain resilience.

10   (N) Disaster preparedness.

11   (O) Natural resources management.

12   (P) Cross cutting challenges in artificial

13   intelligence, including robustness,

14   interpretability, explainability, transparency,

15   safety, privacy, content provenance, and bias

16   mitigation.

17   (2) DESIGNATION.—The grand challenges and

18 prize competition program established under para-

19 graph (1) shall be known as the ''AI Grand Chal-

20 lenges Program''.

21   (3) ROTATORS.—Participants in the Rotator

22 Program of the National Science Foundation may

23 support the development and implementation of the

24 AI Grand Challenges Program.

1 (c) GRAND CHALLENGES SELECTION AND GRAND

2 CHALLENGES INFORMATION.—

3   (1) IN GENERAL.—

4   (A) CONSULTATION ON IDENTIFICATION

5   AND SELECTION.—The Director shall consult

6   with the Director of the Office of Science and

7   Technology Policy, the Director of the National

8   Institute of Standards and Technology, the Di-

9   rector of the Defense Advanced Research

10   Projects Agency, the heads of relevant Federal

11   agencies, and the National Artificial Intelligence

12   Advisory Committee to identify and select arti-

13   ficial intelligence research and development

14   grand challenges in which eligible participants

15   will compete to solve or advance for prize

16   awards under subsection (b).

17   (B) PUBLIC INPUT ON IDENTIFICATION.—

18   The Director shall also seek public input on the

19   identification of artificial intelligence research

20   and development grand challenges.

21   (2) PROBLEM STATEMENTS; SUCCESS

22 METRICS.—For each grand challenge selected under

23 paragraph (1) and the grand challenge under para-

24 graph (3), the Director shall—

1   (A) establish a specific and well-defined
2   grand challenge problem statement and ensure
3   that such problem statement is published on the
4   National Science Foundation website linking
5   out to relevant prize competition listings on the
6   website Challenge.gov that is managed by the
7   General Services Administration; and

8   (B) establish and publish on the website
9   Challenge.gov clear targets, success metrics,
10   and validation protocols for the prize competi-
11   tions designed to address each grand challenge,
12   in order to provide specific benchmarks that
13   will be used to evaluate submissions to the prize
14   competition.

15   (3) GRAND CHALLENGE FOR ARTIFICIAL INTEL-
16   LIGENCE-ENABLED CANCER BREAKTHROUGHS.—

17   (A) REQUIRED PRIZE COMPETITION.—Not
18   later than 1 year after the date of enactment of
19   this Act, the Director, in consultation with the
20   Director of the Office of Science and Tech-
21   nology Policy and the Director of the National
22   Institutes of Health, shall establish not less
23   than 1 grand challenge in which eligible partici-
24   pants will compete in a prize competition to
25   solve or advance solutions for prize awards

6

1   under subsection (b) that seek to advance med-

2   ical breakthroughs to address 1 or more of the

3   most lethal forms of cancer and related

4   comorbidities. The grand challenge shall relate

5   to detection, diagnostics, treatments, thera-

6   peutics, or other innovations in artificial intel-

7   ligence to increase the total quality-adjusted life

8   years of those affected or likely to be affected

9   by cancer.

10   (B) PRIZE AMOUNT.—In carrying out the

11   prize competition under subparagraph (A), the

12   Director shall award not less than $10,000,000

13   in cash prize awards to each winner.

14   (4) AMBITIOUS AND ACHIEVABLE GOALS.—

15   Grand challenges selected under paragraph (1) and

16   the grand challenge under paragraph (3) shall be

17   ambitious but achievable goals that utilize science,

18   technology, and innovation to solve or advance solu-

19   tions to problems to benefit the United States.

20   (d) ADDITIONAL CONSULTATION.—The Director may

21 consult with, and incorporate effective practices from,

22 other entities that have developed successful large-scale

23 technology demonstration prize competitions, including

24 the Defense Advanced Research Projects Agency, the Na-

25 tional Aeronautics and Space Administration, other Fed-

1 eral agencies, private sector enterprises, and nonprofit or-

2 ganizations, in the development and implementation of the

3 AI Grand Challenges Program and related prize competi-

4 tions, including on the requirements under subsection (e).

5   (e) REQUIREMENTS.—

6   (1) IN GENERAL.—The Director shall develop

7   requirements for—

8   (A) the prize competition process, includ-

9   ing eligibility criteria for participants, con-

10   sistent with the requirements under paragraph

11   (2); and

12   (B) testing, judging, and verification pro-

13   cedures for submissions to receive a prize award

14   under the AI Grand Challenges Program.

15   (2) ELIGIBILITY REQUIREMENT AND JUDG-

16   ING.—

17   (A) ELIGIBILITY.—In accordance with the

18   requirement described in section 24(g)(3) of the

19   Stevenson-Wydler Technology Innovation Act of

20   1980 (15 U.S.C. 3719(g)(3)), a recipient of a

21   prize award under the AI Grand Challenges

22   Program—

23   (i) that is a private entity shall be in-

24   corporated in and maintain a primary

25   place of business in the United States; and

1   (ii) who is an individual, whether par-

2   ticipating singly or in a group, shall be a

3   citizen or permanent resident of the United

4   States.

5   (B) JUDGES.—In accordance with section

6   24(k) of the Stevenson-Wydler Technology In-

7   novation Act of 1980 (15 U.S.C. 3719(k)), a

8   judge of a prize competition under the AI

9   Grand Challenges Program may be an indi-

10   vidual from the private sector.

11   (f) PRIZE AMOUNT.—

12   (1) IN GENERAL.—In carrying out the AI

13   Grand Challenges Program, the Director—

14   (A) shall award not less than $1,000,000

15   in cash prize awards to each winner of the prize

16   competitions, except as provided in subsection

17   (c)(3); and

18   (B) may also utilize non-cash awards.

19   (2) LARGER AWARDS.—The Director may

20   award prizes under the AI Grand Challenges Pro-

21   gram that are more than $50,000,000, pursuant to

22   the requirements under section 24(m)(4)(A) of the

23   Stevenson-Wydler Technology Innovation Act of

24   1980 (15 U.S.C. 3719(m)(4)(A)).

25   (g) FUNDING.—

1   (1) IN GENERAL.—In accordance with section

2 24(m)(1) of the Stevenson-Wydler Technology Inno-

3 vation Act of 1980 (15 U.S.C. 3719(m)(1)), the Di-

4 rector may request and accept funds from other

5 Federal agencies, State, United States territory,

6 local, or Tribal government agencies, for-profit enti-

7 ties, and nonprofit entities to support the AI Grand

8 Challenges Program.

9   (2) PROHIBITION ON CONSIDERATION FOR SUP-

10 PORT.—The Director may not consider any support

11 provided by an agency or entity under paragraph (1)

12 in determining the winners of prize awards under

13 subsection (b).

14 (h) REPORTS.—

15   (1) NOTIFICATION OF WINNING SUBMISSION.—

16 Not later than 60 days after the date on which a

17 prize is awarded under the AI Grand Challenges

18 Program, the Director shall submit to the Com-

19 mittee on Commerce, Science, and Transportation of

20 the Senate, the Committee on Science, Space, and

21 Technology of the House of Representatives, and

22 other relevant committees of Congress a report that

23 describes the winning submission to the prize com-

24 petition and its benefits to the United States.

25   (2) BIENNIAL REPORT.—

1   (A) IN GENERAL.—Not later than 2 years
2   after the date of enactment of this Act, and bi-
3   ennially thereafter, the Director shall submit to
4   the Committee on Commerce, Science, and
5   Transportation of the Senate, the Committee on
6   Science, Space, and Technology of the House of
7   Representatives, and other relevant committees
8   of Congress a report that includes—

9   (i) a description of the activities car-
10   ried out under this Act;

11   (ii) a description of the active com-
12   petitions and the results of completed com-
13   petitions under the AI Grand Challenges
14   Program; and

15   (iii) efforts to provide information to
16   the public about the AI Grand Challenges
17   Program to encourage participation.

18   (B) PUBLIC ACCESSIBILITY.—The Director
19   shall make the biennial report required under
20   subparagraph (A) publicly accessible, including
21   by posting the biennial report on the website of
22   the National Science Foundation in an easily
23   accessible location.

24   (i) ACCESSIBILITY.—In carrying out the AI Grand
25 Challenges Program, the Director shall post the active

 1 prize competitions and available prize awards under sub-

 2 section (b) to Challenge.gov after the grand challenges are

 3 selected and the prize competitions are designed pursuant

 4 to subsections (c) and (e) to ensure the prize competitions

 5 are widely accessible to eligible participants.