116TH CONGRESS
1ST SESSION

S. _____

To direct the Director of the National Science Foundation to support research
   on the outputs that may be generated by generative adversarial networks,
   otherwise known as deepfakes, and other comparable techniques that
   may be developed in the future, and for other purposes.

_____

IN THE SENATE OF THE UNITED STATES

_____

Ms. CORTEZ MASTO (for herself and Mr. MORAN) introduced the following
   bill; which was read twice and referred to the Committee on

_____

_____

A BILL

To direct the Director of the National Science Foundation
   to support research on the outputs that may be gen-
   erated by generative adversarial networks, otherwise
   known as deepfakes, and other comparable techniques
   that may be developed in the future, and for other pur-
   poses.

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 "Identifying Outputs

5 of Generative Adversarial Networks Act" or the "IOGAN

6 Act".

SEC. 2. FINDINGS.

Congress finds the following:

(1) Research gaps currently exist on the underlying technology needed to develop tools to identify authentic videos, voice reproduction, or photos from manipulated or synthesized content, including those generated by generative adversarial networks.

(2) The National Science Foundation's focus to support research in artificial intelligence through computer and information science and engineering, cognitive science and psychology, economics and game theory, control theory, linguistics, mathematics, and philosophy, is building a better understanding of how new technologies are shaping the society and economy of the United States.

(3) The National Science Foundation has identified the "10 Big Ideas for NSF Future Investment" including "Harnessing the Data Revolution" and the "Future of Work at the Human-Technology Frontier", in with artificial intelligence is a critical component.

(4) The outputs generated by generative adversarial networks should be included under the umbrella of research described in paragraph (3) given the grave national security and societal impact potential of such networks.

1	　　　(5) Generative adversarial networks are not

2	　　likely to be utilized as the sole technique of artificial

3	　　intelligence or machine learning capable of creating

4	　　credible deepfakes. Other comparable techniques

5	　　may be developed in the future to produce similar

6	　　outputs.

7	**SEC. 3. NSF SUPPORT OF RESEARCH ON MANIPULATED OR**

8	　　　　　**SYNTHESIZED CONTENT AND INFORMATION**

9	　　　　　**SECURITY.**

10	　　The Director of the National Science Foundation, in

11	consultation with other relevant Federal agencies, shall

12	support merit-reviewed and competitively awarded re-

13	search on manipulated or synthesized content and infor-

14	mation authenticity, which may include—

15	　　　　(1) fundamental research on digital forensic

16	　　tools or other technologies for verifying the authen-

17	　　ticity of information and detection of manipulated or

18	　　synthesized content, including content generated by

19	　　generative adversarial networks;

20	　　　　(2) fundamental research on technical tools for

21	　　identifying manipulated or synthesized content, such

22	　　as watermarking systems for generated media;

23	　　　　(3) social and behavioral research related to

24	　　manipulated or synthesized content, including the

4

1   ethics of the technology and human engagement

2   with the content;

3   (4) research on public understanding and

4   awareness of manipulated and synthesized content,

5   including research on best practices for educating

6   the public to discern authenticity of digital content;

7   and

8   (5) research awards coordinated with other fed-

9   eral agencies and programs, including the Net-

10   working and Information Technology Research and

11   Development Program, the Defense Advanced Re-

12   search Projects Agency, and the Intelligence Ad-

13   vanced Research Projects Agency.

14   **SEC. 4. NIST SUPPORT FOR RESEARCH AND STANDARDS ON**

15   **GENERATIVE ADVERSARIAL NETWORKS.**

16   (a) IN GENERAL.—The Director of the National In-

17   stitute of Standards and Technology shall support re-

18   search for the development of measurements and stand-

19   ards necessary to accelerate the development of the tech-

20   nological tools to examine the function and outputs of gen-

21   erative adversarial networks or other technologies that

22   synthesize or manipulate content.

23   (b) OUTREACH.—The Director of the National Insti-

24   tute of Standards and Technology shall conduct out-

25   reach—

1   (1) to receive input from private, public, and

2 academic stakeholders on fundamental measure-

3 ments and standards research necessary to examine

4 the function and outputs of generative adversarial

5 networks; and

6   (2) to consider the feasibility of an ongoing

7 public and private sector engagement to develop vol-

8 untary standards for the function and outputs of

9 generative adversarial networks or other technologies

10 that synthesize or manipulate content.

11 **SEC. 5. REPORT ON FEASIBILITY OF PUBLIC-PRIVATE**

12 **PARTNERSHIP TO DETECT MANIPULATED OR**

13 **SYNTHESIZED CONTENT.**

14   Not later than 1 year after the date of enactment

15 of this Act, the Director of the National Science Founda-

16 tion and the Director of the National Institute of Stand-

17 ards and Technology shall jointly submit to the Committee

18 on Science, Space, and Technology of the House of Rep-

19 resentatives, the Subcommittee on Commerce, Justice,

20 Science, and Related Agencies of the Committee on Appro-

21 priations of the House of Representatives, the Committee

22 on Commerce, Science, and Transportation of the Senate,

23 and the Subcommittee on Commerce, Justice, Science,

24 and Related Agencies of the Committee on Appropriations

25 of the Senate a report containing—

1   (1) the Directors' findings with respect to the
2   feasibility for research opportunities with the private
3   sector, including digital media companies to detect
4   the function and outputs of generative adversarial
5   networks or other technologies that synthesize or
6   manipulate content; and

7   (2) any policy recommendations of the Direc-
8   tors that could facilitate and improve communication
9   and coordination between the private sector, the Na-
10   tional Science Foundation, and relevant Federal
11   agencies through the implementation of innovative
12   approaches to detect digital content produced by
13   generative adversarial networks or other technologies
14   that synthesize or manipulate content.

SEC. 6. GENERATIVE ADVERSARIAL NETWORK DEFINED.

16   In this Act, the term ''generative adversarial net-
17 work'' means, with respect to artificial intelligence, the
18 machine learning process of attempting to cause a gener-
19 ator artificial neural network (referred to in this para-
20 graph as the ''generator'' and a discriminator artificial
21 neural network (referred to in this paragraph as a ''dis-
22 criminator'') to compete against each other to become
23 more accurate in their function and outputs, through
24 which the generator and discriminator create a feedback
25 loop, causing the generator to produce increasingly higher-

1 quality artificial outputs and the discriminator to increas-

2 ingly improve in detecting such artificial outputs.