

116TH CONGRESS
2^D SESSION

S. 2904

AN ACT

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.

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”.

7 **SEC. 2. FINDINGS.**

8 Congress finds the following:

9 (1) Gaps currently exist on the underlying re-
10 search needed to develop tools that detect videos,
11 audio files, or photos that have manipulated or syn-
12 thesized content, including those generated by gen-
13 erative adversarial networks. Research on digital
14 forensics is also needed to identify, preserve, recover,
15 and analyze the provenance of digital artifacts.

16 (2) The National Science Foundation’s focus to
17 support research in artificial intelligence through
18 computer and information science and engineering,
19 cognitive science and psychology, economics and
20 game theory, control theory, linguistics, mathe-
21 matics, and philosophy, is building a better under-
22 standing of how new technologies are shaping the
23 society and economy of the United States.

24 (3) The National Science Foundation has iden-
25 tified the “10 Big Ideas for NSF Future Invest-

1 ment” including “Harnessing the Data Revolution”
2 and the “Future of Work at the Human-Technology
3 Frontier”, with artificial intelligence is a critical
4 component.

5 (4) The outputs generated by generative adver-
6 sarial networks should be included under the um-
7 brella of research described in paragraph (3) given
8 the grave national security and societal impact po-
9 tential of such networks.

10 (5) Generative adversarial networks are not
11 likely to be utilized as the sole technique of artificial
12 intelligence or machine learning capable of creating
13 credible deepfakes. Other techniques may be devel-
14 oped in the future to produce similar outputs.

15 **SEC. 3. NSF SUPPORT OF RESEARCH ON MANIPULATED OR**
16 **SYNTHESIZED CONTENT AND INFORMATION**
17 **SECURITY.**

18 The Director of the National Science Foundation, in
19 consultation with other relevant Federal agencies, shall
20 support merit-reviewed and competitively awarded re-
21 search on manipulated or synthesized content and infor-
22 mation authenticity, which may include—

23 (1) fundamental research on digital forensic
24 tools or other technologies for verifying the authen-
25 ticity of information and detection of manipulated or

1 synthesized content, including content generated by
2 generative adversarial networks;

3 (2) fundamental research on technical tools for
4 identifying manipulated or synthesized content, such
5 as watermarking systems for generated media;

6 (3) social and behavioral research related to
7 manipulated or synthesized content, including
8 human engagement with the content;

9 (4) research on public understanding and
10 awareness of manipulated and synthesized content,
11 including research on best practices for educating
12 the public to discern authenticity of digital content;
13 and

14 (5) research awards coordinated with other fed-
15 eral agencies and programs, including the Defense
16 Advanced Research Projects Agency and the Intel-
17 ligence Advanced Research Projects Agency, with co-
18 ordination enabled by the Networking and Informa-
19 tion Technology Research and Development Pro-
20 gram.

21 **SEC. 4. NIST SUPPORT FOR RESEARCH AND STANDARDS ON**
22 **GENERATIVE ADVERSARIAL NETWORKS.**

23 (a) IN GENERAL.—The Director of the National In-
24 stitute of Standards and Technology shall support re-
25 search for the development of measurements and stand-

1 ards necessary to accelerate the development of the tech-
2 nological tools to examine the function and outputs of gen-
3 erative adversarial networks or other technologies that
4 synthesize or manipulate content.

5 (b) OUTREACH.—The Director of the National Insti-
6 tute of Standards and Technology shall conduct out-
7 reach—

8 (1) to receive input from private, public, and
9 academic stakeholders on fundamental measure-
10 ments and standards research necessary to examine
11 the function and outputs of generative adversarial
12 networks; and

13 (2) to consider the feasibility of an ongoing
14 public and private sector engagement to develop vol-
15 untary standards for the function and outputs of
16 generative adversarial networks or other technologies
17 that synthesize or manipulate content.

18 **SEC. 5. REPORT ON FEASIBILITY OF PUBLIC-PRIVATE**
19 **PARTNERSHIP TO DETECT MANIPULATED OR**
20 **SYNTHESIZED CONTENT.**

21 Not later than 1 year after the date of enactment
22 of this Act, the Director of the National Science Founda-
23 tion and the Director of the National Institute of Stand-
24 ards and Technology shall jointly submit to the Committee
25 on Science, Space, and Technology of the House of Rep-

1 representatives, the Subcommittee on Commerce, Justice,
2 Science, and Related Agencies of the Committee on Appro-
3 priations of the House of Representatives, the Committee
4 on Commerce, Science, and Transportation of the Senate,
5 and the Subcommittee on Commerce, Justice, Science,
6 and Related Agencies of the Committee on Appropriations
7 of the Senate a report containing—

8 (1) the Directors’ findings with respect to the
9 feasibility for research opportunities with the private
10 sector, including digital media companies to detect
11 the function and outputs of generative adversarial
12 networks or other technologies that synthesize or
13 manipulate content; and

14 (2) any policy recommendations of the Direc-
15 tors that could facilitate and improve communication
16 and coordination between the private sector, the Na-
17 tional Science Foundation, and relevant Federal
18 agencies through the implementation of innovative
19 approaches to detect digital content produced by
20 generative adversarial networks or other technologies
21 that synthesize or manipulate content.

22 **SEC. 6. GENERATIVE ADVERSARIAL NETWORK DEFINED.**

23 In this Act, the term “generative adversarial net-
24 work” means, with respect to artificial intelligence, the
25 machine learning process of attempting to cause a gener-

1 ator artificial neural network (referred to in this para-
2 graph as the “generator” and a discriminator artificial
3 neural network (referred to in this paragraph as a “dis-
4 criminator”) to compete against each other to become
5 more accurate in their function and outputs, through
6 which the generator and discriminator create a feedback
7 loop, causing the generator to produce increasingly higher-
8 quality artificial outputs and the discriminator to increas-
9 ingly improve in detecting such artificial outputs.

Passed the Senate November 18, 2020.

Attest:

Secretary.

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