

116TH CONGRESS
1ST SESSION

H. R. 4355

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 HOUSE OF REPRESENTATIVES

SEPTEMBER 17, 2019

Mr. GONZALEZ of Ohio (for himself, Ms. STEVENS, Mr. BAIRD, and Ms. HILL of California) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

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”.

1 **SEC. 2. FINDINGS.**

2 Congress finds the following:

3 (1) Research gaps currently exist on the under-
4 lying technology needed to develop tools to identify
5 authentic videos, voice reproduction, or photos from
6 those generated by generative adversarial networks.

7 (2) The National Science Foundation's focus to
8 support research in artificial intelligence through
9 computer and information science and engineering,
10 cognitive science and psychology, economics and
11 game theory, control theory, linguistics, mathe-
12 matics, and philosophy, is building a better under-
13 standing of how new technologies are shaping the
14 society and economy of the United States.

15 (3) The National Science Foundation has iden-
16 tified the "10 Big Ideas for NSF Future Invest-
17 ment" including "Harnessing the Data Revolution"
18 and the "Future of Work at the Human-Technology
19 Frontier", in with artificial intelligence is a critical
20 component.

21 (4) The outputs generated by generative adver-
22 sarial networks should be included under the um-
23 brella of research described in paragraph (3) given
24 the grave national security and societal impact po-
25 tential 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 and other comparable techniques
5 may be developed in the future to produce similar
6 outputs.

7 **SEC. 3. NSF SUPPORT OF RESEARCH FOR OUTPUTS OF**
8 **GENERATIVE ADVERSARIAL NETWORKS.**

9 The Director of the National Science Foundation, in
10 consultation with other relevant Federal agencies, shall
11 support merit-reviewed and competitively awarded re-
12 search on the science and ethics of material produced by
13 generative adversarial networks, which may include—

14 (1) supplementing fundamental research on dig-
15 ital media forensic tools or comparable technologies
16 for detection of the outputs of generative adversarial
17 networks completed by the Defense Advanced Re-
18 search Projects Agency and the Intelligence Ad-
19 vanced Research Projects Activity;

20 (2) fundamental research on developing con-
21 straint aware generative adversarial networks; and

22 (3) social and behavioral research on the ethics
23 of the technology, and human engagement with the
24 networks.

1 **SEC. 4. NIST SUPPORT FOR RESEARCH AND STANDARDS ON**
2 **GENERATIVE ADVERSARIAL NETWORKS.**

3 (a) IN GENERAL.—The Director of the National In-
4 stitute of Standards and Technology shall support re-
5 search for the development of measurements and stand-
6 ards necessary to accelerate the development of the tech-
7 nological tools to examine the function and outputs of gen-
8 erative adversarial networks.

9 (b) OUTREACH.—The Director of the National Insti-
10 tute of Standards and Technology shall conduct out-
11 reach—

12 (1) to receive input from private, public, and
13 academic stakeholders on fundamental measure-
14 ments and standards research necessary to examine
15 the function and outputs of generative of generative
16 adversarial networks or to develop constraint aware
17 generative adversarial networks; and

18 (2) to consider the feasibility of an ongoing
19 public and private sector engagement to develop vol-
20 untary standards for the outputs of generative ad-
21 versarial networks or comparable technologies.

1 **SEC. 5. REPORT ON FEASIBILITY OF PUBLIC-PRIVATE**
2 **PARTNERSHIP TO DETECT OUTPUTS OF GEN-**
3 **ERATIVE ADVERSARIAL NETWORKS AND**
4 **COMPARABLE TECHNOLOGIES.**

5 Not later than one year after the date of the enact-
6 ment of this Act, the Director of the National Science
7 Foundation and the Director of the National Institute of
8 Standards and Technology shall jointly submit to the
9 Committee on Science, Space, and Technology of the
10 House of Representatives and the Committee on Com-
11 merce, Science, and Transportation a report containing—

12 (1) the Directors' findings with respect to the
13 feasibility for research opportunities with the private
14 sector, including digital media companies to detect
15 the outputs of generative adversarial networks or
16 comparable technologies; and

17 (2) any policy recommendations of the Direc-
18 tors that could facilitate and improve communication
19 and coordination between the private sector, the Na-
20 tional Science Foundation, and relevant Federal
21 agencies through the implementation of innovative
22 approaches to detect media products produced by
23 generative adversarial networks or comparable tech-
24 nologies.

25 **SEC. 6. DEFINITIONS.**

26 In this Act:

1 (1) GENERATIVE ADVERSARIAL NETWORK.—

2 The term “generative adversarial network” means,
3 with respect to artificial intelligence, the machine
4 learning process of attempting to cause a generator
5 artificial neural network (referred to in this para-
6 graph as the “generator” and a discriminator artifi-
7 cial neural network (referred to in this paragraph as
8 a “discriminator”)) to compete against each other to
9 become more accurate in their function and outputs,
10 through which the generator and discriminator cre-
11 ate a feedback loop, causing the generator to
12 produce increasingly higher-quality artificial outputs
13 and the discriminator to increasingly improve in de-
14 tecting such artificial outputs.

15 (2) COMPARABLE TECHNOLOGY.—The term
16 “comparable technology” means technology that uti-
17 lizes similar techniques to achieve the same outputs
18 as a generative adversarial network.

19 (3) CONSTRAINT AWARE.—The term “con-
20 straint aware” means, with respect to artificial intel-
21 ligence, the generation of realistic relational data by
22 a machine with constraint on the modules generated
23 by an adversarial network.

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