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Congress of the United States
House of Representatives

November 26, 2018

Dr. Walter G. Copan
Undersecretary of Commerce for Standards and Technology
National Institute of Standards and Technology Director
100 Bureau Drive
Gaithersburg, MD 20899

Dear Dr. Copan:

With the advent of advanced technologies, such as facial recognition, the global community is on the brink of what has sometimes been referred to as the fourth industrial revolution.[1] Like other periods of significant technological change, the associated economic and social impacts are projected to be just as, if not more so, significant. Technology is disrupting nearly every industry and is on track to transform entire systems of production, management, and governance at a rate that is without historical precedent.[2] I write today with optimism for the potential of technology to continue to improve society, but with the understanding that government must play its part in guiding the use of technology – including facial recognition technology – down optimal paths.

Facial recognition technologies have applications in law enforcement, intelligence, military operations, humanitarian work, commercial enterprise,[3] and schools.[4] Facial recognition is a powerful tool that is permeating American life, and, yet, the propensity of the technology to misidentify individuals, particularly in regard to variances in skin-type and gender is well documented.[5] Some developers have historically sold facial recognition technology by focusing on overall accuracy rates that may obscure disproportionately high rates of misidentification of certain demographic subgroups.[6] The potential for illegal discrimination and/or unfair practices resulting from such bias continues to concern lawmakers.

As highlighted in a May 2016 White House report, poorly selected data; incomplete, incorrect or outdated data; selection bias; and unintentional perpetuation and promotion of historical biases can all lead to discriminatory results.[7] One study suggests that facial recognition algorithms, as used in government and other applications, consistently perform worse on certain demographics, but could improve demographic

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[1] Schwab, Klaus. "The Fourth Industrial Revolution: What It Means and How to Respond," Foreign Affairs, December 12, 2015. https://www.foreignaffairs.com/articles/2015-12-12/fourth-industrial-revolution.
[2] Klaus, 2015.
[3] Deeks, Ashley and Shannon Togawa Mercer. "Facial Recognition Software: Costs and Benefits," Lawfare Online, March 27, 2018. https://www.lawfareblog.com/facial-recognition-software-costs-and-benefits.
[4] Rose, Ashley. "Facial Recognition Increasing in Schools," GovTech Online, August 1, 2018. http://www.govtech.com/em/preparedness/Facial-Recognition-Increasing-in-Schools.html.
[5] Hardesty, Larry. "Study Finds Gender and Skin-Type Bias in Commercial Artificial Intelligence Systems," MIT News, February 11, 2018. http://news.mit.edu/2018/study-finds-gender-skin-type-bias-artificial-intelligence-systems-0212.
[6] Karp, Paul. "Facial Matching System Risks Racial Bias, Human Rights Law Centre Warns," The Guardian, May 29, 2018. https://www.theguardian.com/technology/2018/may/30/facial-matching-system-is-racist-human-rights-law-centre-warns.
[7] Executive Office of the President, Archives. (2016). *Big Data: A Report on Algorithmic Systems, Opportunity, and Civil Rights.* Retrieved from https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/2016_0504 _data_discrimination.pdf.

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accuracy by improving training methodology and approach.[8] It is my belief that customers of this technology should be well informed about appropriate, and credible, testing standards. This concern will remain particularly salient considering reports that Amazon, a developer of facial recognition technology, pitched the sale of its technology to ICE to presumably be used in diverse populations.[9]

To that end, I am requesting that NIST design and endorse industry standards and ethical best practices for independent testing of demographic based error rates in facial recognition technology. Some facial recognition technology vendors do not participate in Face Recognition Vendor Tests or in Face in Video Evaluations, and demographic based discrimination in algorithms is often unnoticed by developers unless effectively included in testing. In addition, I request information on any data sets that NIST makes available to facial recognition technology developers and the steps that NIST is taking to ensure that these datasets reflect demographic diversity and operational conditions.

While the exact definition of "algorithmic fairness" is a complicated issue that is not easily resolved,[10] further guidance for identifying and mitigating unintended, unjustified and/or inappropriate demographic sub-group bias is a critical step. Standards informed by demographic concerns also benefit government and private sector customers who may not be conversant about an algorithm's potential for bias;[11] illegal discrimination resulting from such biases place company investors and the American public at significant risk.[12] [13]

I thank you for the great work NIST has done thus far, and I look forward to further dialogue on this issue.

Sincerely,

Emanuel Cleaver, II
Member of Congress

CC: The Honorable Wilbur Ross, U.S. Secretary of Commerce

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[8] Klare, Brendan, Mark Burge, Joshua Klontz, Richard Vorder Bruegge, and Anil Jain. "Face Recogniton Performance: Role of Demographic Information," IEEE Transactions on Information Forensics and Security, December 2012. http://openbiometrics.org/publications/klare2012demographics.pdf.

[9] Harwell, Drew. "Amazon Met With ICE Officials Over Faceial-Recogniton System That Could Identify Immigrants," Washington Post, October 23, 2018. https://www.washingtonpost.com/technology/2018/10/23/amazon-met-with-ice-officials-over-facial-recognition-system-that-could-identify-immigrants/?utm_term=.ebd2470b3bba.

[10] Hudson, Laura. "Technology Is Biased Too. How Do We Fix It?," FiveThirtyEight, July 20, 2017. https://fivethirtyeight.com/features/technology-is-biased-too-how-do-we-fix-it/.

[11] Garvie, Clare, Alvaro Bedoya, and Jonathan Frankle, "The Perpetual Line-Up: Unregulated Police Facial Recognition in America," Center on Privacy & Technology at Georgetown Law, October 18, 2016. https://www.perpetuallineup.org/.

[12] O'Neil, Cathy. "Amazon's Gender-Biased Algorithm Is Not Alone," Bloomberg, October 16, 2018. https://www.bloomberg.com /opinion/articles/2018-10-16/amazon-s-gender-biased-algorithm-is-not-alone.

[13] Buolamwini, Joy. "When the Robot Doesn't See Dark Skin," New York Times Opinion, June 21, 2018. https://www.nytimes.com/2018/06/21/opinion/facial-analysis-technology-bias.html.