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SUBMITTED ELECTRONICALLY

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Mrs. Elham Tabassi
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AI-Standards
National Institute of Standards and Technology
100 Bureau Drive, Stop 2000
Gaithersburg, MD 20899

Ref.: Artificial Intelligence Standards, Department of Commerce Docket No. 190312229-9229-01, 84 Fed. Reg. 18490 (May 1, 2019)

Dear Mrs. Elham Tabassi:

On behalf of the members of the Alliance of Automobile Manufacturers ("Alliance")[1], we are pleased to submit comments in response to the National Institute of Standards and Technology's ("NIST") request for information to create a plan for Federal engagement in the development of technical standards and related tools in support of reliable, robust, and trustworthy systems that use artificial intelligence ("AI") technologies. The February 11, 2019 Executive Order ("EO") on Maintaining American Leadership in Artificial Intelligence[2] directs NIST to create this plan. Overall, Alliance members support this EO and plan for Federal engagement in the development of technical standards, and view it as an important step by the President to facilitate the safe and responsible deployment of AI technologies, which have the potential to improve quality of life and provide numerous economic and societal benefits.

Background

Since the advent of automated driving systems ("ADS"), automakers have become leaders in AI systems and are intimately aware of the potential benefits of this technology. Improving safety on our nation's roadways is a primary motivation for automakers. In 2017 alone, 37,133 fatalities occurred as a result of vehicle crashes in the United States. Automated vehicles have the potential to reduce this number by using advanced sensing technologies combined with AI programming to avoid crashes. Unlike conventional human drivers, an ADS cannot get distracted, drive aggressively or inebriated, or fall asleep at the wheel. In addition to these safety benefits, automated vehicles hold the promise to

[1] The Auto Alliance is the leading representative for the auto industry. Its members include BMW Group, FCA US LLC, Ford Motor Company, General Motors Company, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche, Toyota, Volkswagen Group of America and Volvo Cars North America, and represent approximately 70 percent of all car and light truck sales in the United States. For further details, see http://www.autoalliance.org/.
[2] https://www.whitehouse.gov/presidential-actions/executive-order-maintaining-american-leadership-artificial-intelligence/

provide numerous social and economic benefits, including less congestion, lower fuel consumption, and increased access to mobility for the elderly and those with disabilities.

The research and development ("R&D") occurring in the U.S. to develop AI for automobiles is staggering. Billions of dollars are being invested globally to develop ADS technology and high definition maps, and to test and validate automated driving features. Automakers are complimenting in-house R&D with major acquisitions of, and partnerships with, companies solely focused on developing AI software. AI also provides the automotive industry with the potential to optimize its value chain and support functions. Use cases for AI can be found in vehicle manufacturing, logistics, finance, and in customer interactions within and outside of the vehicle. AI can enhance safety, increase process efficiency, and improve user experience.

Guidelines

AI is a critical technology to developing the next generation of mobility. Now is an ideal time to begin the process to create technical standards to support reliable, robust and trustworthy systems that use AI technologies. Standardization will help drive market adoption of AI, and will assist with the evaluation of diverse AI systems. The Alliance supports the EO's principles that potential technical standards for AI should: 1) reduce barriers to the safe testing and deployment of AI technologies; 2) foster public trust and confidence in AI technologies; 3) be flexible to promote innovation; and, 4) create buy-in within appropriate private and public sector entities.

To help facilitate the creation of these standards, the Alliance recommends that NIST develop guidelines, harmonized with ongoing AI standards setting activities[3], that include the following topics for consideration: Data, Performance, Privacy, Risk Assessment, Safety, and Transparency.

Data

AI systems use algorithms to build models based on sample data to make predictions or decisions. Machine learning algorithms require massive amounts of data to train and improve performance. As such, AI systems depend on the quality and quantity of data used to "train" them in order to function appropriately. NIST should benchmark existing flexible data ecosystems, responsible for data quality, including integrity, that have guidelines for structuring and annotating data, as well as identify and create incentives for voluntary data sharing among stakeholders that conforms with applicable antitrust, privacy and data protection laws and policies.

Performance

Technical performance guidelines should be implemented to promote the development of AI systems that are robust and work as intended. Performance guidelines are preferred to spur innovation and provide flexibility for developers and designers in the development of reliable, robust, and trustworthy AI systems. A performance-based approach has been highly effective for the automotive industry.

[3] *See* ISO/IEC JTC 1/SC 42.

Today's vehicles include highly advanced technologies and features, making them the safest in decades. For AI systems, performance guidelines can be distinguished based on application and use case. Development of these guidelines will require close coordination with all stakeholders, including government, industry, and academia.

Privacy

The EO on Maintaining American Leadership in Artificial Intelligence directs that privacy must be protected in the application of AI technologies in order to fully realize their potential.[4] Potential guidelines should consider the collection and use of data consistent with applicable laws and policies, and be adaptable to different use cases to allow designers and developers to protect the privacy of data sources. The Alliance recommends that NIST consult the Consumer Privacy Protection Principles: Privacy Principles for Vehicle Technologies and Services[5] developed by the automotive industry. These comprehensive and groundbreaking Principles incorporate long-standing Fair Information Practice Principles to establish a set of baseline protections for consumer personal information used with connected vehicle technologies, and could inform privacy protections for any system that uses AI technologies.

Risk Assessment

NIST should establish a framework to assess risk for AI systems to prevent harm and support continued AI development. This framework should identify potential threats and vulnerabilities, provide an understanding of security impacts, and specify guidelines to mitigate risks. It should consider the user (e.g., internal, business-to-business ("B2B"), and business-to-consumer ("B2C")), the usability (Does the AI interact within a physical environment or is it a software tool only? Is it safety relevant?), the quality of the dataset, the sensitivity of the data (e.g., in respect to personal data and antitrust regulations), and the algorithm used. Levels of risk should be differentiated by use case and include participation by a variety of stakeholders. Within use cases, the Alliance proposes distinguishing between different levels of autonomy in decision-making (AI as an information source only, AI as an assistant with final decision by user, or fully autonomous without human involvement), and different levels of autonomy in learning (no retraining possible on the market, limited retraining possible (no safety-relevant parameters), or full retraining possible on the market).

Safety

Safety is a top priority of the automotive industry. Potential AI guidelines should ensure consistency with the current automotive regulatory framework according to the Motor Vehicle Safety Act [6]. Vehicle manufacturers have the responsibility to certify that the vehicles they put on public roads comply with Federal Motor Vehicle Safety Standards ("FMVSS") applicable at the time of manufacture. As part of this self-certification framework, NHTSA performs compliance testing of

[4] https://www.whitehouse.gov/presidential-actions/executive-order-maintaining-american-leadership-artificial-intelligence/
[5] https://autoalliance.org/wp-content/uploads/2017/01/Consumer_Privacy_Principlesfor_VehicleTechnologies_Services-03-21-19.pdf
[6] *See* 49 U.S.C. §301.

randomly-selected vehicles offered for sale to the general public to assess whether they meet the pertinent FMVSS. This process, which is well-established, helps NHTSA and the industry assure that motor vehicle safety is upheld. Vehicles that incorporate AI algorithms should fall under the same certification framework. This safety conformance regime will ensure that vehicles using AI-based systems will meet Federal safety requirements as well as the expectations of the public.

It should be noted that sensors designed (and trained) to function correctly in specific operational design domains ("ODD"), such as highways or urban streets in fair weather, will not perform optimally if tested on proving grounds that do not resemble their ODD. Therefore, it is paramount that tests are designed properly with respect to a given ADS-operated vehicle's ODD.

Transparency

Transparency within AI can be defined as the ability of the AI system to explain the rationale of the decision-making of its algorithmic learning procedures. The appropriate level of transparency will differ by application and use case, yet will be necessary to foster public trust and confidence in AI technologies. Increased transparency may be necessary for developers and operators to ensure quality monitoring and continuous improvement. The thresholds for transparency should also be balanced with the protection of confidential business information, and with respect to the benefit of the application and necessary accuracy, since for some models and/or use cases, an increase in interpretability can come with a decrease in accuracy.

It should be noted that the deep neural networks ("DNN") used in computer learning algorithms for vision systems, as well as for object detection using Lidar or Radar, are trained to classify labeled data in an optimal manner. This training uses well-known mathematics to optimize millions of internal parameters such that the networks yield optimal results on an average for a given training set. Despite recent work on "explainable AI," the Alliance does not expect that it will be possible to explain precisely why a DNN classifies an object as "class A" vs. "class B" in any given case – at least if both cases look quite similar. Given this limitation, it is only possible to evaluate the performance of a given ADS feature using a sufficiently large test data set.

International Harmonization

In addition to the recommendations for guidelines outlined above, the Alliance underscores the EO's call to enhance international and industry collaboration with foreign partners and allies. International collaboration is critically important to Alliance members, who are global companies operating in a global market. The Alliance supports the approach outlined in the EO to work collaboratively with international partners and researchers to support domestic AI research and open markets for domestic AI industries, while protecting American priorities.

To this end, the Alliance strongly encourages NIST to strengthen international cooperation and promote the development of globally harmonized standards for AI. NIST should collaborate with international standards bodies such as the International Organization for Standardization ("ISO") and the International Electrotechnical Commission ("IEC"). In 2017, IEC and ISO became the first

international standards development organization to set up a joint technical committee[7] ("ISO/IEC JTC 1/SC 42") to carry out standardization activities for artificial intelligence, and provide guidance to JTC 1, IEC and ISO committees developing AI applications. The joint committee seeks to look at the entire ecosystem of AI, and includes diverse stakeholders to leverage existing work. The United States, through the American National Standards Institute ("ANSI") is a member of ISO/IEC JTC 1 and a number of its committees.

In addition, the Alliance recommends that NIST review the Organisation for Economic Co-operation and Development ("OECD") AI Principles[8] and the Institute of Electrical and Electronics Engineers - United States of America ("IEEE-USA") Artificial Intelligence & Autonomous Systems Policy Committee ("AI&ASPC") policy positions.

Thank you for this opportunity to provide input on the creation of a plan for Federal engagement in the development of technical standards and related tools in support of reliable, robust, and trustworthy systems that use AI technologies. We appreciate your work to facilitate the benefits of AI while protecting American values and priorities. Please let us know if we can provide further information that would be helpful.

Respectfully submitted,

Anne Marie Lewis PhD,
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[7] *See* ISO/IEC JTC 1/SC 42.
[8] https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449