FEDERAL AGENCIES SHOULD STAY IN THE BACK SEAT FOR AI STANDARD SETTING

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This comment is in response to the National Institute of Standards and Technology's (NIST) request for information on artificial intelligence (AI) standards.

The views expressed in this comment are solely ours, and they do not represent the views of our employers or any particular affected party or special interest group. The purpose of this comment is to assist NIST as it considers a plan for federal engagement in the development of AI technical standards.[1]

The authors of this comment are researchers and practitioners in machine learning and standards development. Julian Chan of Bates White and Weifeng Zhong of the Mercatus Center are core maintainers of the open-source Policy Change Index,[2] a machine learning project that uses state-controlled media to predict policy changes. Matthew Jensen of the American Enterprise Institute is a co-creator of the Policy Simulation Library,[3] a collection of community-developed, open-source models and standards for policy analysis.

[1] As requested by NIST, this comment focuses on technical standards in AI technologies and does not cover ethical, legal, or other non-technical aspects of AI development.
[2] See the project website, policychangeindex.org, for more information.
[3] See the project website, pslmodels.org, for more information.

As practitioners in the field, we understand that it is important for the government to monitor the development of technical standards and that there might be circumstances under which the government's active engagement is called for. However, based on our research and review of the relevant academic literature, we believe that it is currently not the right place nor the right time for such an active involvement by the government.

Necessary Conditions for Government Involvement in Standard Setting

While there is a general consensus that having good technical standards benefits innovation, there is much less agreement about how the economy can arrive at good standards and what active role the government should play in standard setting.[4]

At the minimum, the rationale for government involvement in standard setting has two necessary — but not sufficient — conditions identified in the economics literature: (1) The market fails to provide the right kind and appropriate amount of standards, and (2) the government has the knowledge and capability to correct the market failure.[5]

In the context of AI standards, there is currently no evidence that Condition (1) is satisfied, and it is also unclear whether Condition (2) would hold, should the government actively step in the standard-setting process.

No Sign of Significant Market Failure in AI Standard Setting

Generally speaking, standard setting can take place in two ways — in the private sector, either through competition among market players or multilateral standards development organizations (SDOs), or by government mandate. Standardization in the US has a long-held, market-driven tradition, as opposed to a reliance on government direction and control. This paradigm has served America's industrial development well, and it is no exception in the rise of AI technologies.

In recent years, international SDOs have been playing a promising role in developing AI standards. The two most prominent ones are the ISO/IEC JTC 1/SC 42 (SC 42) and the IEEE-SA's P7000 series of A/IS Standards.[6]

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[4] Shane Greenstein and Victor Stango, ed., *Standards and Public Policy* (Cambridge: Cambridge University Press, 2006).
[5] G. M. Peter Swann, *The Economics of Standardization* (London: Department of Trade and Industry, 2000).
[6] The former, created in 2017, is the subcommittee on AI (SC 42) under the International Organization for Standardization (ISO) and the International Electrotechnical Commission's (IEC) joint technical committee JTC 1. The latter, launched in 2016, is a series of Autonomous and Intelligent Systems (A/IS) working groups under the Institute of Electrical and Electronics Engineers' (IEEE) Standards Association (SA).

American companies and experts are actively participating in the above mentioned international SDOs, and the latter are producing a series of standards covering various aspects of AI technologies. For example, of all the 15 officers in the SC 42 at the time of writing, five are from the US, while no other country has more than two. As of March 2019, the SC 42 has published three standards, with 11 more under development. Their standards work has covered a variety of aspects in AI, such as concepts and terminology, machine learning framework, the robustness of neural network models, and risk management of AI systems, among others.

In areas of standards development where international SDOs have not covered, private companies and academics have been stepping in effectively. As mentioned in another submitted comment in response to the request for information, by the Office of Intelligence and Analysis of the Department of Homeland Security,[7] AI standards developed by corporate and academic stakeholders do exist and are being followed, such as MLPerf, for measuring the performance of machine learning systems, and SpaceNet, for capturing and analyzing satellite images.

Therefore, as AI technologies keep advancing on a global scale, there is no sign that the market mechanism is failing in the development of these important standards.

Government Failure May Occur in AI Standard Setting

Even in the event of the market failing to provide the optimal level of the right standards, it does not imply that active government involvement would lead to a better outcome. In fact, as is well studied in the literature, government failure in standard setting is a possibility that should not be overlooked.

Stanford economist Paul David, known internationally for his contributions in the economics of science and technology, famously coined the risk of government failure in standard setting as the Blind Giant's Quandary.[8] According to David, the time when the government is the most powerful (i.e., being a giant) in influencing the future trajectory of a technology is often the time when the government knows the least about what should be done (i.e., being blind-sighted). Exercising positive influence in this situation requires important information about how producers' technologies and consumers'

[7] Office of Intelligence and Analysis, Department of Homeland Security, *AI: Using Standards to Mitigate Risks* (Comment in response to the Request for Information about Federal Engagement in Artificial Intelligence Standards, 2019), https://www.nist.gov/sites/default/files/documents/2019/05/20/nist-ai-rfi-dhs-001.pdf.

[8] Paul A. David, "Some New Standards for the Economics of Standardization in the Information Age," in *Economic Policy and Technological Performance*, ed. Partha Dasgupta and Paul Stoneman (Cambridge: Cambridge University Press, 1987).

preferences will evolve — the kind of information the market is best capable of discovering.

The state of AI development fits squarely in such a scenario. The technologies are still in an initial but fast-growing stage. Uncertainties regarding the future of technological advances and consumers attitude toward them are abundant. Moreover, appropriate AI standards are and will remain highly domain-specific and context-dependent in applications. For example, will supervised learning, unsupervised learning, or reinforcement learning dominate in machine learning research? Will graphics processing units (GPUs) remain the leading hardware for neural network computations, or will its place be taken by a next-generation accelerator, such as tensor processing units (TPUs)? Faced with these consequential questions, it is highly unclear whether public policy has any more role to play than letting the market resolve the uncertainties.

Recommendations

We conclude this comment with a set of questions for NIST and other federal agencies to consider before taking active steps in AI standard setting:

1. Is there a market failure that prevents the economy from settling on the optimal level and the right kind of standards? For example, is there a lack of private incentives that results in too few standards? Or, are companies “locked-in” on some inferior standards because they failed to coordinate?
2. Does the government have the knowledge of how to bring the economy from the current, inferior standards to more superior alternatives? If so, what prevents the market — but not the government, presumably — from obtaining such knowledge?
3. How does government-led standard setting resolve the market failure? Does the government have the necessary resources — institutional knowledge, subject-matter expertise, etc. — to move the market? Would exerting such influence lead to unintended consequences or incur unjustified costs to the rest of the economy?

Conclusion

The US policy toward science and technology has a long-standing, virtuous tradition of the government taking the back seat. We believe that AI policies should following this tradition, as opposed to being an exception. Before NIST or other federal agencies decide to intervene in AI standards development, we recommend that the above questions be given careful consideration.

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