ALGORITHMIC INCLUSION

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INTRODUCTION

Artificial Intelligence (AI) is expected to dramatically change humanity. From the automation of daily tasks and labor, to curing diseases and handling disasters, many forecast that human beings will soon begin enjoying the benefits of AI technology within many aspects of their lives.[1] While it is currently difficult to evaluate when and to what extent AI will live up to fulfill its promise, it is uncertain whether the continued development of AI technology will widen the already existing *digital divide* between those with access to technology and those without.[2]

The concern of a new digital divide that could stem from AI technology had been articulated by Professor Peter K. Yu as the *algorithmic divide*.[3] In his Article, Professor Yu describes the potential inequalities that these technological developments will likely create and intensify.[4] Much like the digital divide,[5] Professor Yu argues, there will be a "new inequitable gap" between those with access to new technologies and those without, while the latter will miss out "on the many political, social, economic, cultural, educational, and career opportunities provided by machine learning and artificial intelligence."[6] This Response adds to the discussion of the perceived forthcoming algorithm divide by further analyzing key issues that emerge within the goal of inclusion. The first Part briefly summarizes the algorithmic divide

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1. For more on the impact of AI on our daily lives, *see generally*, Craig S. Smith, *Artificial Intelligence: A Special Report*, NY TIMES (Apr. 12, 2020), https://www.nytimes.com/spotlight/artificial-intelligence [https://perma.cc/8MRJ-CJZ8].

2. The *digital divide* generally refers to gaps or uneven distribution in access and use of information and information communication technologies, and perhaps mainly, to disparities in access to the internet. *See, e.g.*, RANETA LAWSON MACK, THE DIGITAL DIVIDE: STANDING AT THE INTERSECTION OF RACE & TECHNOLOGY xiii (2001); ANNE PEACOCK, HUMAN RIGHTS AND THE DIGITAL DIVIDE 2, 7, 11–12 (2019); MASSIMO RAGNEDDA, THE THIRD DIGITAL DIVIDE: A WEBERIAN APPROACH TO DIGITAL INEQUALITIES 18 (2017); Peter K. Yu, *Bridging the Digital Divide: Equality in the Information Age*, 20 CARDOZO ARTS & ENT. L.J. 1, 2 (2002).

3. *See generally* Peter Yu, *The Algorithmic Divide and Equality in the Age of Artificial Intelligence*, 72 FLA. L. REV. 331 (2020) (focusing on how the digital divide creates a new inequitable gap between the technology haves and have-nots). Others have coined this as the AI Divide. *See, e.g.*, MATTHEW L. SMITH & SUJAYA NEUPANE, INT'L DEV. RESEARCH CTR., ARTIFICIAL INTELLIGENCE AND HUMAN DEVELOPMENT: TOWARD A RESEARCH AGENDA 58 (2018), http://hdl.handle.net/10625/56949.

4. *See* Yu, *supra* note 3, at 343.

5. *See* Yu, *supra* note 2, at 2.

6. *See* Yu, *supra* note 3, at 334–35.

as projected by Professor Yu and his suggestions to reduce the risks and fears that stem from it. The second Part then raises further caveats and key issues that must be taken into consideration when discussing how to bridge the algorithmic divide.

I. THE ALGORITHMIC DIVIDE

Humanity is unlikely to equally enjoy the benefits of the perceived AI revolution—leading to a so-called *algorithmic divide* between those that enjoy the benefits of AI and machine learning technology and those that do not.[7] This divide is expected to affect individuals both locally and globally while generating at least three perceived problems: algorithmic deprivation, algorithmic discrimination, and algorithmic distortion.[8] Deprivation of AI technology refers to possibilities that individuals might miss out on.[9] To exemplify, consider how AI technology might aid developing countries in areas like disaster relief,[10] healthcare,[11] food production and agriculture,[12] education,[13] and policy analysis.[14] Discrimination due to erroneous or biased algorithms or data could negatively impact many, but perhaps more profoundly, groups that are often disadvantaged or even more vulnerable.[15] Finally, improper algorithms or tainted data could create distortion which affects all individuals, not merely those on "the unfortunate side", as excluding some parts of the world might eventually harm it as a whole.[16]

To address these concerns, Professor Yu offers seven non-exhaustive

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7. *See id.* at 333–34. For more discussions on AI as another digital divide, *see, e.g.,* Enrique Dans, *Artificial Intelligence is the New Digital Divide*, MEDIUM (Nov 22, 2016), https://medium.com/enrique-dans/artificial-intelligence-is-the-new-digital-divide-736cd52fe906 [https://perma.cc/X3XA-ZHMV].

8. *See* Yu, *supra* note 3, at 343–61.

9. *See* Yu, *supra* note 3, at Section IIA.

10. As Professor Yu notes, a known example is of the devastating earthquake that occurred in Nepal, whereas the deployment of machine learning and AI aided in facilitating rescue, relief, and reconstruction efforts. *See id*. at 345–46.

11. Health care could highly benefit from the use of AI. One example is the of training "doctors, nurses, and other health professionals as well as to provide medical assistance." *See id*. at 347.

12. *See id*. at 348 ("Algorithm-enhanced technologies will also help them increase crop yield, telling them when to plant and fertilize and what seeds to use based on local climate and soil conditions.").

13. *See id*. at 349 ("Computers equipped with learning algorithms have also been used as tutors. These "intelligent" tutors not only can track the participants' progress but will also be able to adjust teaching coverage and pace based on such progress.").

14. *See id*. at 350.

15. *See id*. at 355–59; *see, e.g.,* Sandra G. Mayson, *Bias In, Bias Out*, 128 YALE L.J. 2218, 2231–32 (2019); Kristin N. Johnson, *Automating the Risk of Bias*, 87 GEO. WASH. L. REV. 1214, 1240 (2019).

16. *See* Yu, *supra* note 3, at 359–61.

clusters of remedial actions: (1) increasing algorithmic literacy; (2) amelioration of algorithmic deprivation and discrimination by facilitating access to new algorithm-enhanced products and services while developing a more inclusive environment; (3) investing in ethics while developing ethical standards for AI development and use on the international level; (4) increasing transparency of both data and algorithmic outcomes; (5) increasing public accountability and institutional oversight; (6) increasing and facilitating competition within the market; and (7) having a realistic perspective on bridging the algorithmic divide.[17]

The acknowledgement of a potential algorithmic divide is important on a local and global scale. Society should generally strive to expand access to machine learning and AI to those who are less technologically privileged, thereby promoting social inclusion. AI does promise a future with improved quality of life for all humanity. These seven actions, along with the important taxonomy of the algorithmic divide that Professor Yu offers, are important to aid policymakers and other decisionmakers in properly shaping the future of this divide, and more holistically, this world. Yet, to foster greater equality, policymakers should also be wary of how such inclusion will be performed, as the actions taken might also lead to undesired outcomes. Part II introduces some of these concerns by raising caveats on the measures that might reduce the perceived inequality gaps and suggesting how policymakers should handle them.

II. BRIDGING THE INEQUITABLE GAP

The normative discussion on how to bridge the algorithmic divide—the social unevenness of accessing and enjoying advanced technology—could be narrowed down to *inclusion*.[18] Without AI inclusion, some cohorts might be physically or cognitively barred or limited from using technologies that could dramatically affect their daily lives, thereby increasing both physical and digital inequalities, on both a local and global scale.[19]

Bridging the inequitable gap that AI will likely cause seems like a rather uncontested task for humanity. Many policymakers, scholars, journalists, and other interested parties have already discussed, suggested, and articulated various AI principles or guidelines—many of which are aligned with Professor Yu's suggestions—and this conversation is likely to continue in the upcoming years.[20] But while

17. *Id.* at 362–88.

18. *See* Yu, *supra* note 3, at 333–34.

19. *See* Yu, *supra* note 3, at 334.

20. Ethical artificial intelligence has deserved much attention in recent years by policymakers, private companies, organizations, and researchers in a quest to find how AI should be optimally constructed. *See, e.g.*, Anna Jobin, Marcello Ienca & Effy Vayena, *The Global*

inclusion is not generally contested as a noble cause, its practical outcomes must be carefully examined to gain a better understanding of the consequences and the potential risks and harms that AI inclusion could entail. Only upon understanding the social, technological, and political context of AI inclusion within societies can policymakers attempt to metaphorically steer the ship of AI use, distribution, and access.

Inclusion does not necessarily mean full equality in access to AI, but rather ensuring that those without access also have an ability to enjoy at least primer benefits of such technology in uncontested contexts.[21] Policymakers should generally strive to reach AI inclusiveness *in impact*—a just distribution of AI's benefits for less privileged populations.[22] But AI inclusiveness should also be *in design*—diversifying those who develop AI, and *in policy*—those who make decisions regarding their use, so that these technologies mirror the complexity, diversity, and necessities of society more accurately and rightfully.[23] In both instances, inclusiveness means participation in the process, or a right not to be excluded from technology and policymaking that could shape many aspects of our society.[24]

Before exemplifying and discussing how inclusiveness should be accomplished, it is important to first place two caveats. The first relates to forecasts. There is a possibility, perhaps even a high probability that during this century, AI technology will evolve into a realm once only reserved to science fiction, and that some of these perceived developments will influence humanity in many aspects. At the same time, one must be careful to not overstate the promises that AI technology entails, along with their impact. AI abilities might be overestimated or

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Landscape of AI Ethics Guidelines, 1 NATURE MACHINE INTELLIGENCE 389, 389 (2019). Often, these groups focused on five core ethical principles for ethical AI: transparency, justice and fairness, non-maleficence, responsibility, and privacy. Various principles and guidelines on ethical AI also included promoting beneficence, accountability, freedom and autonomy, trust, sustainability, dignity, and solidarity. *Id.* at 394–96. A study conducted by the Berkman-Klein center for internet and society compared and analyzed thirty-six prominent AI principles documents from around the world, and found eight key themes: privacy; accountability; safety and security; transparency and explainability; fairness and non-discrimination; human control of technology; professional responsibility; and promotion of human values. *See generally* Jessica Fjeld et al., *Principled Artificial Intelligence: Mapping Consensus in Ethical and Rights-based Approaches to Principles for AI*, BERKMAN KLEIN CENTER FOR INTERNET & SOCIETY 5 (2020) https://dash.harvard.edu/handle/1/42160420 [https://perma.cc/K4YF-JSA4].

21. *See* Fjeld, supra note 20, at 51.

22. *See* Fjeld, supra note 20, at 51 ("'Inclusiveness in impact' as a principle calls for a just distribution of AI's benefits, particularly to populations that have historically been excluded.").

23. *Id.* at 52 ("The 'inclusiveness in design' principle stands for the idea that ethical and rights-respecting AI requires more diverse participation in the development process for AI systems.").

24. *Id.* at 51.

even merely a hype,[25] and it might not reach its anticipated future.

Within the discussion of AI and inclusion, the second caveat relates to the algorithmic gap itself. Even if AI technology fulfills its promises, that does not yet imply that an algorithmic gap will form. It could be even perceived as too presumptuous to forecast how and to what extent eventually this divide will be shaped. If it forms, the algorithmic divide might shape differently from the digital divide. Despite their many similarities, there could be many differences that will eventually lead the algorithmic divide into a different trajectory.

Consider the example of the market in shaping the future trajectory of AI. The market that produces, sells, and distributes AI technology might evolve into something different from it is today—perhaps even forming new types of corporate responsibilities or legal entities.[26] With the rise in platform governance in recent years,[27] and without meaningful governmental intervention, these platforms could make important decisions on who has access to AI benefits and who is excluded. Even if these companies remain purely economically driven, they might be incentivized to strategically increase accessibility to their platforms and services, thereby investing in bringing AI technology everywhere, to everyone.

For now, let us assume that while the predictions regarding the scope of AI abilities or the exact time that AI will become so advanced are unlikely to be precisive, AI meets its predictions and the algorithmic gap has formed. At this point, if the law or other modalities have not already shaped methods to bridge such gap, then the law is likely to step in further.[28] But to what extent should the law step in? How do different societies treat this gap, and why should it be different from the already existing gaps that this world is experiencing?

At this point, policymakers should adhere to the seven non-exhaustive clusters of remedial actions offered by Professor Yu. There should be little doubt of the importance to invest in matters like reducing knowledge gaps; increasing access to AI; reducing its bias and potential

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25. One can use the Gartner Hype Cycle for AI to get some insights on the potential hype around AI technology. *See* Louis Columbus, *What's New in Gartner's Hype Cycle For AI, 2020*, FORBES (Oct. 4, 2020), https://www.forbes.com/sites/louiscolumbus/2020/10/04/whats-new-in-gartners-hype-cycle-for-ai-2020/?sh=4a81abe9335c [https://perma.cc/M5YN-XAUL].

26. *See, e.g.*, Michael Wade, *Corporate Responsibility in the Digital Era*, MIT SLOAN (Apr. 28, 2020), https://sloanreview.mit.edu/article/corporate-responsibility-in-the-digital-era [https://perma.cc/XYK8-4F3Z].

27. *See, e.g.*, Kate Klonick, *The New Governors: The People, Rules, and Processes Governing Online Speech*, 131 HARV. L. REV. 1598, 1662–63 (2018); Tarleton Gillespie, *Platforms are Not Intermediaries*, 2 GEO. L. TECH. REV. 198, 199 (2018).

28. The term "modalities" in this context refers to Lawrence Lessig's behavior regulation by the law, the market, social norms, and architecture. *See* LAWRENCE LESSIG, CODE: VERSION 2.0 120–37 (2006).

discrimination; investing in ethics and further developing ethical standards for constructing, using and deploying AI; and increasing public accountability and institutional oversight, to exemplify few remedial solutions proposed to overcome the perceivable gap.[29] But while inclusiveness is important, one must also closely consider the potential negative implications of intervention.

One of the key questions that will affect the outcomes of decisions to accommodate inclusion relates to the *who*—the identity of those who will decide for those deprived of AI technology. Domestically, those with AI capabilities might have the ability to decide the scope of inclusiveness for their own population.[30] But those areas without such capabilities will depend on those with such capabilities. Within the global perspective, it is anticipated that some "Northern" countries, perhaps most notably China and the United States,[31] will gain the most out of AI and gain a unique advantage of making decisions on AI future trajectory, including its inclusive nature.[32]

These decisionmakers should strive for inclusiveness in both the *design* of the systems and the *policies* regarding the deployment of AI in less privileged populations, whether it is locally or globally. To optimally bridge the algorithmic gap, there must be fair global representation around the metaphorical table—whether the table means developing AI or constructing policies that involve its use.[33]

Another key question that should be closely addressed relates to the impact of such policies on society. This aspect could be exemplified by automation.[34] Consider the potential impact of what had been coined as the fourth industrial revolution or "Industry 4.0."[35] With the rise in computational powers and computer storage, AI and automation could make systemic changes to how industries operate. Tasks once performed by humans are expected to become automated, and the human element

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29. *See* Yu, *supra* note 3, at 362–88.

30. *See* Yu, *supra* note 3, at 370.

31. Notably, there are other countries that are reported to also lead the AI market, e.g., France, Israel, United Kingdom, Germany, and Japan. *See* Kathleen Walch, *Why the Race for AI Dominance Is More Global Than You Think*, FORBES (Feb. 9, 2020), https://www.forbes.com/sites/cognitiveworld/2020/02/09/why-the-race-for-ai-dominance-is-more-global-than-you-think/?sh=3bc1b63c121f [https://perma.cc/8HLE-GQX6].

32. *See* Ross Chainey, *The global economy will be $16 trillion bigger by 2030 thanks to AI*, WORLD ECON. FORUM (June 27, 2017), https://www.weforum.org/agenda/2017/06/the-global-economy-will-be-14-bigger-in-2030-because-of-ai [https://perma.cc/LVR4-KNH2]; Andres Lombana Bermudez, *Artificial Intelligence (AI) and the Evolution of Digital Divides*, VVVALOG (July 13, 2017) https://andreslombana.net/blog/2017/07/30/artificial-intelligence-ai-and-the-evolution-of-digital-divides/ [https://perma.cc/A97K-8ZTG].

33. *See* Fjeld, supra note 20, at 51.

34. *See* Yu, *supra* note 3, at n.82.

35. *See generally* KLAUS SCHWAB, THE FOURTH INDUSTRIAL REVOLUTION (2016) (introducing the concept of the Fourth Industrial Revolution).

will play little, if any, part in the manufacturing or production process.[36]

At this point, one might argue that everyone should equally enjoy the benefits of such automation, and this is exactly where policymakers should bridge gaps between those with access and those without. But these policymakers must also scrutinize the implications of the fourth industrial revolution. How will this revolution effect those without technology? While intuitively, it might seem that Industry 4.0 will improve life quality, it would be highly presumptuous to quantify well-being in this respect. It is not a realistic perspective on bridging the algorithmic divide. Inclusion should not mean that those with abilities give them to those without, but rather aid them in reaching or accessing somewhat similar capabilities and letting them choose what fits their society best. This Response does not intend to argue that Industry 4.0 will not make our lives easier. It is expected to make it more efficient or improve the life quality of many. But efficiency might be less important for some societies than others, and not everyone will perceive automation as improvement of their life quality. The expectations of an individual or society for a good life might simply be perceived differently.

Here is one intersection where policymakers must make tough decisions on where and how to deploy automated technology. Every decision made will affect those without technology, whether domestically or globally. Automation might incite polarization in the labor market[37]—perhaps also relying more on local production and nationalization—and lead many businesses to shift from countries that might suffer economic harm.[38] Factories will close their gates, and people will lose their jobs, not only within the realm of those with AI technology, but also where AI is not even in use.[39] If policymakers choose to also enable access to AI technology for those without, these societies will have to learn how to

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36. This is due, *inter alia*, to the continuous rise in computing powers, storage capabilities, and various technological developments in the field of AI and automation. In what eventually became "Moore's Law," Gordon Moore had famously argued back in 1965 that computing powers (the number of transistors) on a microchip will double roughly every two years. Still, Moore's law's might soon reach its physical limits. *See* David Rotman, *We're Not Prepared for the End of Moore's Law*, MIT TECH. REV. (Feb. 24, 2020), https://www.technologyreview.com/2020/02/24/905789/were-not-prepared-for-the-end-of-moores-law [https://perma.cc/6XDY-H9BE].

37. *See* Ralph Hamann*, Developing Countries Need to Wake Up to the Risks of New Technologies*, CONVERSATION (Jan. 4, 2018, 2:06 AM), https://theconversation.com/developingcountries-need-to-wake-up-to-the-risks-of-new-technologies-872 13 [https ://perma.cc/YE9HDPFD].

38. *See, e.g.*, Asha Bharadwaj & Maximiliano A. Dvorkin, *The Rise of Automation: How Robots May Impact the U.S. Labor Market*, FED. RES. ST. LOUIS (July 10, 2019), https://www.stlouisfed.org/publications/regional-economist/second-quarter-2019/rise-automation-robots [https://perma.cc/8AXT-UASE].

39. *Id*.

adapt to Industry 4.0.[40] Not every economy will handle such move equally. It is thus crucial to mitigate the risks that could stem from a non-optimal transition into a new revolution and take various considerations into account when doing so.

These considerations must not rely simply on adaptivity or access to technology, but also on the desirability of AI inclusion. Inclusion should not mean that states and actors overuse their powers to "make" other states automated as well, at least without considering their right to make autonomous choices. When considering inclusion in design, or more closely in policymaking, the voices of different populations and cohorts regarding the use of AI must be heard. As mentioned, not every cohort will equally prioritize efficiency or share similar social values, and some might even adhere to Neo-Luddism—opposing modern technology or some of it.[41] Not every cohort or society desires to become an algorithmic one.[42]

Supposing that a society desires to benefit from AI, and that policymakers strive for inclusiveness, they should rely on a narrow perception of inclusion at first. A one-size-fits-all approach might not be optimal when it comes to AI and inclusion. These policymakers must differentiate between more and less critical areas when intervening, especially if such intervention might yield undesired outcomes—those that policymakers had not perceived or desired. Inclusion must first focus on the promotion of physical and mental health, humanitarian crisis and resilience, and education and learning abilities,[43] among other areas that might be perceived as critical to focus on.[44] Some might also value the expected benefits of AI in other areas like infrastructure and information communication technologies. But industrial automation could be considered as less important, especially without understanding the

40. *See* Hamann, *supra* note 37.

41. *See, e.g.*, Jamie Bartlett, *Will 2018 Be the Year of the Neo-Luddite?*, THE GUARDIAN (Mar. 4, 2018), https://www.theguardian.com/technology/2018/mar/04/will-2018-be-the-year-of-the-neo-luddite [https://perma.cc/9YUZ-EZC7].

42. For a definition of the algorithmic society, *see* Jack M. Balkin, *The Three Laws of Robotics in the Age of Big Data*, 78 OHIO ST. L.J. 1217, 1219 (2017).

43. Beyond increasing access to knowledge, a gap that already exists within the digital divide, the possibilities of deploying AI and machine learning capabilities within the realm of education and learning must play a substantial role within the inclusion-agenda. For more on AI and learning, *see, e.g.,* Barbara Kurshan, *The Future of Artificial Intelligence in Education*, FORBES (Mar. 10, 2016), https://www.forbes.com/sites/barbarakurshan/2016/03/10/the-future-of-artificial-intelligence-in-education/?sh=5a942b4d2e4d [https://perma.cc/67VV-47WD].

44. See for instance the USC CAIS project regarding the use of AI that focuses on seven core areas: (1) homelessness, (2) suicide prevention, (3) substance abuse treatment and prevention, (4) conservation and sustainability, (5) promoting health and well-being, (6) disaster planning and community resilience, and (7) fairness, equity and bias. *See Project Core Areas*, USC, https://www.cais.usc.edu/projects (last visited Nov. 29, 2020) [https://perma.cc/R4TU-QB6V].

ramification of such inclusion.

In addition, when it comes to the use of sophisticated algorithms and AI, there could be wide discrepancies within the perception of human rights and liberties. One of the most crucial elements to consider within the inclusion of AI is the legal regime in which the law is implemented through. For instance, AI could be misused in some regimes against their citizens or foreigners, while violating basic human rights and liberties.[45] It might be used and misused as weapons by enforcement agencies and militaries.[46] Thus, beyond the requirements of transparency in the use and deployment of AI, one might suggest that bridging the algorithmic divide also necessitates understanding the potential long-term ramifications of access to AI and the legal framework in which these technologies will operate in. Lacking comprehensive data protection regulation or oversight mechanisms could suggest limiting the deployment of AI in these regimes.

In other words, while algorithmic inclusion is generally a noble cause, its implementation might also backfire. Not all is equal in the world, let alone in the context of access to technology.[47] It does not mean that the world should not strive to eliminate gaps between cohorts. Poverty, hunger, disasters, or even simply access to adequate medical treatment are things which no human being should endure in the twenty-first century. If AI technology can be deployed to aid states in reducing gaps—may they be physical, digital, or algorithmic—then those with capabilities should have a duty, if not legal than a moral one, to share their prosperity to aid those in peril.[48]

AI inclusion does not necessarily mean that the world must be equal in its AI capabilities. Much like any revolution, some cohorts will enjoy the benefits of AI more than others, both domestically and internationally. AI will not likely magically remove all existing gaps in the world, and even with regulation, it might even widen existing gaps. But to make sure that the use of AI is responsible, to the least, its use might require global

45. Rohinton P. Medhora, AI & Global Governance. *Three Paths Towards a Global Governance of Artificial Intelligence*, UNITED NATIONS U. CTR. POL'Y RES. (Oct. 28, 2018), https://cpr.unu.edu/ai-global-governance-three-paths-towards-a-globalgovernance-of-artificial-intelligence.html [https://perma.cc/5TBZ-ZP4A].

46. Will Knight, *Military Artificial Intelligence Can be Easily and Dangerously Fooled*, MIT TECH. REV. (Oct. 21, 2019) https://www.technologyreview.com/2019/10/21/132277/military-artificial-intelligence-can-be-easily-and-dangerously-fooled/ [https://perma.cc/5ENX-ZZA9].

47. *See* Yu, *supra* note 2, at 2.

48. Obviously, that would extend to any use of AI that undoubtedly aids in better protecting the environment.

governance much like the world has done with nuclear powers.[49] In other words, the first step towards equality, or more closely guarding those without from the risks of AI, is creating some form of global governance against the misuse of these technologies by actors that might risk the global fabric or humanity itself. Only with such shared global governance that will consider these considerations will there be room for discussing the proper form of AI and inclusion both globally and locally.

CONCLUSION

It is difficult to forecast how AI will eventually be deployed around the world. Still, the possibility of an algorithmic gap is certainly a plausible one, and an assumption that I generally share. There is much to be done to make AI developments more inclusive for those which might be deprived of these technologies and their benefits. Professor Yu's suggestions are a great starting point for policymakers. But such moves must also be highly sensitive to understand the environment in which they operate, and to the identity of who makes such critical decisions. Failing to acknowledge differences when attempting to make everything similar could create new challenges beyond the gap itself.

49. *See generally* TREVOR FINDLAY, NUCLEAR ENERGY AND GLOBAL GOVERNANCE: ENSURING SAFETY, SECURITY AND NON-PROLIFERATION (2010) (explaining the governance of nuclear power).