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Honorable Committee Members,

On behalf of the University of Virginia School of Law, we want to applaud the Committee's efforts in defining and describing the right to science and scientific advancement. The Draft General Comment does an excellent job of outlining the elements of these rights and their limitations. It also draws a clear connection between science and the enjoyment of other economic, social, and cultural rights. Overall, we believe this Comment provides valuable guidance to States, civil society, and corporations on the rights and responsibilities related to science.

In order to ensure the Comment is comprehensive in its guidance to rights-holders, duty-bearers, and other stakeholders, we recommend revisions to a few select sections. We present our recommendations below, with a particular emphasis on Section G, Part V of the Draft Comment, formerly titled "Risks and promises of the so called 4th industrial revolution."

1. **Part III, Section A, Paragraph 23**: The paragraph defines four dimensions of accessibility. In order to assuage some of the fears around emerging technologies, we recommend that the Committee include language that address state and corporate responsibility to promote vocational job training and job placement opportunities for those fearing temporary or long-term job loss as a result of technological advances. We suggest the following language to be added to this Section:

    a. "And, States and corporate partners should ensure that those vulnerable to temporary and long-term job loss as a result of scientific and technological advances are provided and encouraged to pursue vocational job training and other job placement opportunities."
    b. The above suggested language could supplement the Comment's definition of the third dimension of accessibility.

2. **Part IV, Section C, Post-Paragraph 44:** This Section ensures that historically disadvantaged groups such as women and persons with disabilities are provided special protection. We recommend that immediately following paragraph 44, the Committee add a new paragraph that specifically speaks to LGBTQ+ rights and access to science. There is growing data that indicates that many LGBTQ+ are underrepresented and often face discrimination in science, technology, engineering, and math fields (STEM). Acknowledging that such discrimination exists and ensuring LGBTQ+ groups are protected will make this Section even more comprehensive. We suggest the following preliminary language:

    a. LGBTQ+, Paragraph 45. "LGBTQ+ are underrepresented in science, technology, engineering, and math fields. They continue to face significant discrimination at school and in the workplace, which prevents the full enjoyment of their right to participate in scientific advancement. States must ensure that all barriers to access for those identifying as LGBTQ+ are eliminated. State policies on the enjoyment of scientific progress should be gender inclusive and gender neutral."

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3. **Part V, Section C, Paragraph 66:** In this Section, the General Comment addresses the "unreasonably high costs for access to essential medicine." Given the present lack of access to free and affordable health care or reasonably priced medicine in many States worldwide, it is our recommendation that the Committee add a separate paragraph that speaks specifically to this State responsibility. The Comment could also note the importance of pairing scientific advancements in medicine and health care with broader accessibility for basic health services.

4. **Part V, Section G:** The Committee's effort to highlight the human rights-related impact of evolving technologies, such as AI, robotics, and others, is integral to the right to science in the 21st century. To provide clear and comprehensive guidance on these emerging technologies, we suggest the following revisions:

   a. We recommend changing the title of the Section to "**Risks and promises of new and emerging technologies in the early 21st century**." We believe that this title provides a more accurate and universal definition of this subclass of scientific advancement. The former title, "Risks and promises of the so called 4th industrial revolution", is vague and susceptible to being seen as Western-centric. Critics of the term "4th industrial revolution" have also noted that the nomenclature presents history in a revolutionary, rather than an evolutionary, framework and often focuses on male innovators and industrialists, while ignoring the significant contributions of women.
   b. Currently, the Section has four paragraphs. We recommend adding a paragraph on corporate responsibility to mitigate human rights violations vis-à-vis emerging technologies. Corporations are key players in the creation and dissemination of these technologies. It is critical that the General Comment address the outsized role of corporations in honoring the right to science and ensuring that scientific advancements never lose sight of economic, social, and cultural rights more generally.
   c. Following is an edited version of the Section.

Risks and promises of new and emerging technologies in the early 21st century [suggested language]

75. Significant advancements in data gathering, computing capacity, and gene manipulation in the early 21st century have begun to blur the boundaries between the physical, digital, and biological worlds. Technologies and techniques, such as facial recognition, artificial intelligence (AI),[1] robotics, 3D printing, blockchain, genetic engineering, and quantum computers, are already changing the way humans live their lives and interact with one another, the natural world, private corporations, and the State.

76. As is always the case, these emerging technologies possess both positive and negative potential toward the enjoyment of ESCR. For instance, commercial and governmental applications of AI will lead to enormous gains in productivity and efficiency; genetic engineering may cure previously fatal or crippling diseases; blockchain-based public procurement systems might reduce instances of

[1] See Special rapporteur on the promotion and protection of the right to freedom of opinion and expressions. Report the General Assembly. August 2018. A/73/348, available in https://www.un.org/ga/search/view_doc.asp?symbol=A/73/348.

government corruption; and robots could perform risky jobs previously imposed upon human beings. On the other hand, AI-driven search engines and social-media platforms can reduce individual autonomy, expression, and access to information; 3D printing can provide unregulated avenues for weapons production; genetic engineering may increase existing disparities in access to life-saving treatment; and the use and storage of human data can increase the stranglehold of the surveillance State.

77. States Parties have to adopt policies and measures that expand the benefits of these new technologies while simultaneously reducing their risks. However, there are no easy solutions given the varied nature of these technologies and the inevitability of unanticipated developments and applications. Nevertheless, for the Committee, three elements remain very important: First, international cooperation should be enhanced in this field. Many of the more serious risks need global regulation to be effectively managed and many of the more powerful benefits need transnational collaboration to be equitably realized. Fragmented or siloed national responses to these transnational technologies creates governance gaps detrimental to the enjoyment of ESCR and perpetuates technological divides and developmental disparities. Worldwide acceptance of basic human rights standards should serve as a starting point for these global initiatives.

78. Second, State Parties must ensure these technologies are developed and deployed within a holistic and inclusive human rights framework – including those technologies controlled by the State itself.[2] Crosscutting human rights principles, such as transparency, privacy, non-discrimination,[3] accountability, freedom of expression,[4] and respect for human dignity are at serious risk if they are excluded from the conversation. While relevant regulation should allow necessary room for scientific progress, it should nonetheless be binding. Efficiency and technological advancement should never be allowed to overshadow human rights obligations.[5] For instance, when States Parties transfer State services to digitized AI-based systems, they must ensure that eligible beneficiaries are not unjustly barred due to limited internet proliferation, lack of end-user training, or un-bending automation.[6] State Parties must also demand maximum transparency and disclosure around the use of such AI-based systems.[7]

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[2] See Ibidem; Report of the UN Secretary-General's High-level Panel on Digital Cooperation, available in file:///D:/Documentos/DESC%7D/DESC/Ciencia/DigitalCooperation-report-for%20web.pdf.

[3] The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems. May 2018. Available in https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf.

[4] See Special rapporteur on the promotion and protection of the right to freedom of opinion and expressions. Report the General Assembly. August 2018. A/73/348, available in https://www.un.org/ga/search/view_doc.asp?symbol=A/73/348.

[5] See Special rapporteur on extreme poverty and human rights. Report the General Assembly. October 2019. A/74/48037, available in https://undocs.org/A/74/493.

[6] Ibidem.

[7] Special rapporteur on the promotion and protection of the right to freedom of opinion and expressions, Report the General Assembly. August 2018. A/73/348, available in https://www.un.org/ga/search/view_doc.asp?symbol=A/73/348; The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems. May 2018. Available in https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf.

79. Third, these emerging technologies provide a new and compelling argument for the importance of corporate liability for human rights violations.[8] States Parties should establish a legal framework that incentivizes non-State actors, especially business entities, to exercise human rights due diligence in order to identify, prevent, and mitigate the risks of ESCR violations and provide access to remedy when violations do occur.[9] While the threats posed by big technology ("Big-Tech") companies are particularly great,[10] a wide variety of employers, security forces, and medical institutions are embracing these technologies that, through a façade of human-free objectivity, can further imbed existing disparities and discrimination.[11] As the actors developing, deploying, and benefiting from these scientific advancements, corporations must be held accountable for resulting human rights violations.[12] This legal framework should include, for instance, measures that require companies to prevent discrimination at both the input and output levels of AI systems, facial recognition devices, and other technologies.[13]

We thank the Committee for this opportunity to provide our suggestions and revisions.

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[8] The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems. May 2018. Par 38-41. Available in https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf.

[9] See CESCR General Comment No 24 on State obligations under the International Covenant on Economic, Social and Cultural Rights in the context of business activities, Par 16.; The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems. May 2018. Par 42-59. Available in https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf.

[10] See Special rapporteur on extreme poverty and human rights. Report the General Assembly. October 2019. A/74/48037, available in https://undocs.org/A/74/493.

[11] Ibidem.

[12] See Special rapporteur on extreme poverty and human rights. Report the General Assembly. October 2019. A/74/48037, available in https://undocs.org/A/74/493; Special rapporteur on the promotion and protection of the right to freedom of opinion and expressions, Report the General Assembly. August 2018. A/73/348, available in https://www.un.org/ga/search/view_doc.asp?symbol=A/73/348.

[13] Special rapporteur on the promotion and protection of the right to freedom of opinion and expressions, Report the General Assembly. August 2018. A/73/348, available in https://www.un.org/ga/search/view_doc.asp?symbol=A/73/348; The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems. May 2018. Available in https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf.

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