Reflecting on Diversity and Gender Equality in Artificial Intelligence in Africa

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Abstract

Many ethical issues plague the field of AI, and several ethical solutions, mainly from the Global North, have been proposed. Among the issues inherent in ethical AI are bias and lack of diversity. Openair Africa reports, for example, an enormously low participation/visibility of women in today's digital world. World Economic Report states that worldwide, only about 22% of women are in the field of artificial intelligence compared to 78% of men. In the 2022 Cybersecurity Workforce Report, women account for just 24%. The 2020 Gender Equality Index: Digitalisation and Future of Work also indicates that only one out of two women, 54%, perceive robots and AI positively compared to 67% of men. Thus, this paper discusses diversity and gender equality in AI from the African context. How should we safeguard AI systems from rehashing extant inequality? To what extent can we ensure AI eliminates bias and fosters equality? To this end, this paper proposes a *communal* approach to the conception, design, development, and deployment of AI systems to address this abysmal situation towards a gender-smart and truly inclusive AI in Africa.

Introduction

It is a fact that artificial intelligence is revolutionizing our world with far-reaching consequences on various walks of life, such as education, health, industries, art, and a host of others. Given its humongous impacts, various ethical principles have been proposed to guide its development and deployment to enable it to be at the service of humanity. Among the principles proposed are European Union Act (2023), America AI Bill of Rights (2022), UK Ethical Principles for AI in Defence (2022), NATO Principles of Responsible Use of Artificial Intelligence (2021), US DoD Ethical Principles for Artificial Intelligence (2020), OECD AI

Principles (2019), European Union Ethics Guidelines for Trustworthy AI (2019), IEEE Ethically Aligned Design (2019), Microsoft Responsible AI Principles (2018), Asilomar AI Principles (2017). Among the most cited principles include transparency, inclusion, responsibility, impartiality, reliability, security, limits on use, justice and fairness, non-maleficence, privacy, beneficence, freedom and autonomy, and trust. Some of these principles coincide with the 17 most prevalent principles of Correa et al. (2023), who conducted a meta-analysis of two hundred regulations and ethical guidelines to determine if there is an international agreement on the ethical principles to regulate AI.

A close look at these principles reveals fundamental missing ideas on gender and diversity. However, gender is somewhat implicit in principles such as fairness, transparency, accountability and explainability. The principles do not represent world diversity, whether directly or indirectly. Goffi (2023) states that China, where 20 per cent of the world is located, is hardly represented. The same is true for India, whose 1.36 billion population is practically missing. Latin America, the Middle East and Russia struggle to have their voices heard and represented.

Consequently, this paper focuses on the issue of diversity and gender equality (DGE), one of the ethical issues in AI. What is the state of DGI in Africa? How can DGI be enhanced in AI systems? It discusses existing DGE issues such as gender-based violence, health inequalities, gender pay gap, unpaid work, and uneven funding. It further discusses DGE in AI, such as lack of awareness, digitalisation/digital skill gap, and narrow conception of DGE. The paper concludes by advocating for the communal approach to the AI life circle as a veritable means of not just bolstering AI development in Africa but one that takes its place in the scheme of AI discussion globally.

The Scope of Gender Equality

Gender equality is a basic human right sacrosanct to achieving a flourishing and strife-free world. Goal 5 of the United Nations Sustainable Development Goal is germane to realising other SDGs. This is because it is a crucial human right and a significant criterion for a harmonious and enduring universe. This is part of the reason why its place in the discourse of AI cannot be over-emphasised. According to Tschopp (2021), at the heart of gender issues are issues such as gender-based violence, health inequalities, gender pay gap, unpaid work, and uneven funding. Violence against women incorporates not just physical and psychological violence but also threats of violence in addition to femicide. A report from the World Health Organization indicates that 1 out of 3 women suffer physical or sexual violence during their lives, which is instrumental to preventing women from fulfilling their economic, political, and social rights. Nuwabaine et al. (2023) report that 18.7% of women experience sexual violence. At the core of gender-based violence is women's inability to gain the same access as men to power and resources. Women are persistently at the receiving end of offensive oppression, an offshoot of gender stereotypes and inequality (Nuwabaine et al. 2023).

Gender-based access to healthcare inequalities is another way whereby there is a vast difference in how men and women access healthcare. The data collected from men continues to be used for women under the assumption that it equally represents women's data with a flagrant disregard for the law that mandates women's inclusion in biomedical research. Tschopp (2021) thus concluded that to bring about health equity for women, there is a need for more biomedical research on women, top-notch data, and algorithms representative of a diverse population.

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A third area of gender inequality pertains to remuneration differential found in women and men. WEF (2023) reported that the gender pay gap of 31.5% found worldwide is estimated to take nearly a century to bridge. A World Bank report (2022) stated that almost 2.4 million women worldwide lack similar economic rights as men. International Labour Organization (2016) reported that while 40% of women in paid employment are not contributors to social protection internationally, in Africa, 63.2% of women do not contribute to social protection. Sustainable development nonetheless relies on improved gender quality. European Parliament (2020), the Workplace Gender Equality Agency (WGEA) of the Australian workplace reported a reduction of 21.9% in the pay gap in recent years, which is still relatively high. Estonia in the EU records 20.5%, and the lowest being 3.6% in Romania. However, it is essential to note that a decreased pay gap is insufficient to assume an increase in gender equality because it could just be that women are fewer in paid jobs.

Nurturing children and caring for adult children and elderly relatives are areas where unpaid housework is unequally distributed. ILO (2018) revealed that women engage in unpaid care and household chores 2.6. million times more than men. Such unpaid chores are by no means inconsequential as they are estimated to be equal to three days' work per week. This, thus, influences earnings, women's health, and the ability to be a part of the labour market. According to the Global Gender Gap Index (2020), internationally, just 55% of women aged between 15 and 64 are part of the labour force, in contrast to 78% of men.

Crunchbase (2020) further noted unequal funding as another area of gender inequality. This pertains to women not having equal access to loans and equity capital. Just 3% of venture capital is given to companies that women fund, and this is a recurrent problem during each phase of venture capital allocation. New studies indicate that investors usually pose different questions to women and men during idea pitching. Africa Gender Index Report (2019) stated that in Africa, the regional level recorded some noticeable variations in gender gaps. The inequality between men and women in South Africa was less at 61.3%, while the lowest was at 40.3%, 42.1%, and 43.7% for North, Central, and West Africa, respectively. Africa Gender Index Report (2019:14). The National Council to Prevent Discrimination (2023) in Mexico states that in 2018, 51% of females experienced gender discrimination in virtually all places, including academics, politics, and more.

Artificial Intelligence, Diversity, and Gender Equality

Given the above gender inequality, it is essential to ensure that AI systems do not continue replicating these biases as evidence abounds on this (Aquino 2023). DGE is an emerging area within the broad field of AI. The AI and Gender Equality Index (2020) reported a paucity of data on the issue of DGE. Likewise, there is a lack of explicit representation of AI and DGE in the existing AI principles. Despite these, several studies have shown that AI exacerbates existing inequalities in the world. The AI Index Report (2023) reported an overwhelming disparity between the enrolment for a doctorate in AI to be 78.7% male and 21.3% female. Despite that this portrays a 3.2% increase compared to previous reports, it still indicates that gender imbalance continues to increase in higher education with the attendance consequence for gender inequality. Its (2018) report indicated a critically low representation of women in higher education as applicants for AI jobs. It further revealed that 80% of US AI professors in Ivy League universities were men, and just about one-fourth of the undergraduate students in AI classes at Stanford and University of California were women. This idea is corroborated by Susan Leavy's (2018) assertion that the underrepresentation of women in AI design and the overrepresentation of men has the propensity to reverse the advances already recorded in gender equality. Nonetheless, Element AI (2019) reported that just 18% of papers were authored by women at 21 foremost AI conferences. Spain, Singapore, Taiwan, Australia, and China are the countries with different degrees of towering numbers of women authors.

The situation in industries is not much different. Employing adverts and data from online jobs, the AI index uncovered that men were mainly candidates for AI roles in the US in 2017. Similarly, the Global Gender Gap of The World Economic Forum of 2018 noted that a mere 22% of women are found on the AI professionals network on LinkedIn, with no proof of recent development. The report further noted a particular gap where women, on the one hand,

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have more presence in positions like data analysis and information management, and men, on the other hand, occupy the roles of software engineer and senior management positions. The implication of this lacuna in AI gender diversity and research and development (R&D) is that it creates the risk of AI systems worsening traditional professional inequality even when functioning according to intent. A non-diverse R&D team will be one whose awareness level is low or one with less sensitivity to the risks for either social groups as a whole or vulnerable populations.

Africa, Diversity/Gender Equality in AI

Goffi (2023) opines that the AI terrain in Africa is still grossly underdeveloped as the continent lags in discussions about the formulation of policies and ethical principles that reflect the values and ethos of the continent. Kwao et al. (2023) highlighted eight principles fundamental to teaching AI ethics to future African leaders, especially in the Agricultural and health sectors. They argue that these principles would also help address data bias. Less discussed among the principles are those on respect of human rights, society and the environment, and contestability. Olojede (2023) argued for principles of solidarity, subsidiary, human dignity and natural law as African AI ethical principles that resonate with African values. In a similar vein, Kiemde et al. (2022) argue that there is a need for AI ethics education to foster the incorporation of African AI ethical values, engender diversified AI teams, and consequently create responsible AI in Africa. Borokini et al. (2023) decried the disproportion use of chatbots as females in Nigerian commercial banks, the asymmetry of women in the service industry, the negative perception these elicit in the minds of users, and the reinforcement of prevalent social stereotypes regarding abilities, which could bother on cognitive capabilities of different genders. Ruttkamp-Bloem (2023) leverages the dynamic nature of AI technologies, the unfortunate situation of Africa as an ethical refuse for big technology companies, the import of authentic AI ethics and the necessity for an epistemically fair AI ethics system where Africa participates and leads the discussion opines that epistemic fairness ought to be the basis for regulations to achieve responsible AI ethics in Africa.

Part of what accounts for Africa's backward embrace of AI is the many problems bedevilling the continent, which range from poverty, bad leadership and insecurity. A more directly relevant reason militating against the spread of AI technology is the lack of either electricity, internet, or low bandwidth digitalisation. Amane et al (2020) further highlighted a dissimilar in internet use on the continent, with southern Africa taking the lead with 55%, 12% in central Africa with 149% of the population in southern Africa using mobile subscriptions, 102% in northern Africa and only 50% in central Africa.

These problems, thus, make it impossible for diversity and gender equality in AI to occupy the front burner in Africa, which in turn has made policy formulation impossible. For instance, Research ICT (2023) revealed minimal awareness of AI and DGE as people are more aware of AI's goods and benefits, which tend to overshadow any form of critical attitude. In addition to the report, in my professional relation, many tend to be puzzled regarding the relevance of gender equality and diversity in AI discourse. Some go as far as criticising the move as a mere attention-seeking feminist venture. They are thus oblivious that when a data set is not inclusive, that is, if it does not include a comprehensive amount of data on a diverse population, the resulting algorithm cannot just perpetuate existing gender biases but create new ones as well.

Beyond the lack of awareness of AI vis, vis DGE in Africa, there is also the inadequate conception of

gender along mere binary lines of female and male or sometimes women and girl child. Gender and diversity, however, transcend binary lines. While the issue of intersectionality regarding gender fluidity may not be an issue for serious consideration in Africa, DGE in Africa ought to include people living with disability, minority groups, and vulnerable populations whose voices would otherwise not be heard. By this, DGE is thus not limited or narrowly defined or conceived as the inclusion of women and children; it could thus be the inclusion of men and boys who are differently ordered. Inclusion equally entails a consideration of African languages, cultures, and ethos. More importantly, inclusion further implies that Africa is actively engaged in the discussions of AI internationally and is not merely leaving the lead to the West.

Regarding digitalisation and the digital skill gap in Africa, the Africa Growth Initiative (2023) report, which sampled an average of 21 African countries and 18 G20 countries, indicated Africa is behind G20 countries in thematic areas of digital infrastructure, digital entrepreneurship, digital finance, digital public participation, digital skills indicator. There is thus, an urgent need for Africa to step up in digitalisation and the formulation of AI principles and policy that will not just reflect her collective values and cultural tradition but equally important one that takes cognisance of DGE.

Communal approach to DGE in AI in Africa

This communal approach involves community-based participation and multi-stakeholder engagement, focusing on consultation with varied members. It differs from them because it draws on Africa's values of solidarity and human dignity as fundamental drivers of the approach. The communal approach is not the same as communalism, as the latter springs up the agelong contentious debate regarding collectivism and individualism, which is an unwanted distraction in the AI discourse (Ikuenobe 2018; Olúfémi 2016). It, however, has a close affinity with the principle of common good. It differs from the common good as the Thomistic common good, being referred to, calls on everyone to contribute to the common good (CBCE and W 1996). Whereas the communal approach actively brings relevant parties to the table, it seeks everyone's input; it does not merely encourage the populace to work conscientiously

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as the common good does. Another difference between the duo is that the common good incorporates more cognate ideals like the principle of subsidiarity and natural law than the communal approach encompasses.

The Ubuntu philosophy inspires the communal approach. The term Ubuntu is a derivative of the aphorism Umuntu ngumuntu ngabantu, which translates as the personhood of a person is based on others; that is, an individual is only one because of or through the individuality of others. Desmond Tutu argues that no one was born into the world ready-made; we all learn basic human behaviours. Thus, we need one another to be fully human (Tutu 2004). Ubuntu presents African culture as possessing the capacity to convey empathy, worth, mutuality, give-back, and humanity out of the desire to create and maintain just and reciprocal caring communities. Ubuntu philosophy, wherever applied, enhances an African organisation's aboriginal setting. Endemic in the Ubuntu philosophy is the belief in group solidarity, which plays a pivotal role in the continuity of African communities.

Former President Nelson Mandela extols the value and truth of Ubuntu as a universal worldview foundational to an open society (Mandela 2006). The Ubuntu philosophy, sometimes misunderstood, does not imply that people should not seek solutions to their problems. It means they should examine

whether their actions foster improvements in their community. Another implication of the Ubuntu philosophy is that when people are well-treated, it will likely translate to better performance. Ubuntu underpins African cultural life. It demonstrates mutuality, reciprocity, interconnectedness, common humanity and the responsibility of individuals to one another (Koster 1996).

The communal approach is thus conceived as an engagement where various stakeholders and the end users of AI systems are involved in designing, developing, and deploying AI systems. It incorporates two fundamental values: solidarity and human dignity. The communal approach entails responsible participation and action where it is essential, for instance, for different regional governments or various groups such as academic, non-profit organisations, governments, policymakers, practitioners, developers, data scientists, feminist organisations and other various interest groups to share their perspectives, contribute ideas and create recommendations that can be implemented broadly across the AI lifecycle. Communal, from its etymology, has the feature of fostering a sense of belonging and being owned collectively. It is a co-creation, co-ownership approach. It involves more active collaboration and shuns silos. The communal approach to DGE calls us to look out for one another and not inadvertently fall into the shortfall we want to correct. If the AI system, through its algorithms, undermines diversity and gender equality, our collective humanity and dignity are undermined. AI system that is devoid of DGE does not represent our lived experience. It also does not mirror the profundity of human experience. A consideration of DGE is both a philosophical and moral imperative.

Conclusion

This paper has discussed the various traditional issues that constitute gender inequality. Topics such as gender-based violence, health inequalities, gender pay gap, unpaid work, and uneven funding. It further analyses the AI, diversity and gender equality climate in Africa with the myriad of challenges militating against it – a lack of electricity, lack of internet or low bandwidth, and absence of digitalisation. This section also reveals the various proposals on AI ethics and AI education in Africa, gender stereotypes in banks and the need for Africa to lead the discourse beyond being a mere onlooker. The paper then proposes the communal approach, which hinges on concrete engagements with society and incorporates two fundamental values, solidarity and human dignity, as a framework for building a gender-smart AI system in Africa.

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