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ORIGINAL RESEARCH

Proposing Central Asian AI ethics principles: a multilevel approach for responsible AI

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Abstract
This paper puts forth Central Asian AI ethics principles and proposes a layered strategy tailored for the development of ethical principles in the field of artificial intelligence (AI) in Central Asian countries. This approach includes the customization of AI ethics principles to resonate with local nuances, the formulation of national and regional-level AI ethics principles, and the implementation of sector-specific principles. While countering the narrative of ineffectiveness of the AI ethics principles, this paper underscores the importance of stakeholder collaboration, provides a comprehensive framework, and emphasizes the need for responsible AI practices. By adopting this approach, Central Asian region can contribute towards the regional integration and global discourse on AI ethics while promoting the responsible use of AI technology in their respective countries.

Keywords AI ethics · Central Asia · AI ethics principles · Shared values

1 Background and challenges

Technology ethics as a thematic area for research has increased the curiosity of many academicians and policy makers. Many institutions including academia, think tanks, tech manufacturers as well as governmental and non-governmental organizations have published numerous documents containing AI ethics principles to keep an eye on the ethical production of new innovation technologies. These documents have raised a value debate among all stake holders about their pragmatic importance. Initially there were some radical stances on AI ethics principles which claim that principles alone cannot guarantee ethical AI and these new AI Ethical principles are none other than the reproduction or juxta positioning of classic medical ethics principles [1]. It is evident that ethical developments are not cooping up with the exponential growth of new innovation technologies. A theme that recently became apparent in the academic literature regarding these documents, is the inherent lack of effective and practical methods and processes for producing ethical AI [2]. Different institutes are claiming their principles to be more effective are comprising the overall credibility of these principles.

Some scholars consider these AI ethics principles to be completely useless [3], whereas the main challenge is the bulk production of these value documents which cause a practical hurdle in their adoption even if there is willingness to adopt them, is their nature of conflicting values. Different documents portray different sets of values. When a trade-off between two values emerges, a choice must be made to prioritize one set of values over another. To overcome this problem, some scholars have advocated for the advancement of risk-based approach which calls upon performing a risk-based ethical assessment for assessing the ethical impact underneath the introduction of an innovation either technological or organizational in a system [4]. Whereas some scholars propose a complementary approach that is based on virtue ethics and constitute the prerequisite for ethical decision making in the AI field. It defines the concept of "basic

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AI virtues", which include justice, honesty, responsibility and care, all of which represent specific motivational settings and describe measures for successfully cultivating of these virtues in organizations dealing with AI research and development [5].However, some scholars believe that the AI ethics is a Just like a critical theory that aims to diagnose as well as change society and is fundamentally concerned with human emancipation and empowerment [6].

Among all these discussions, we generally observe two distinct perspectives in the realm of AI ethics principles: one for tech manufacturers and another for tech users. Most AI ethics principles cater to tech manufacturers, while few address the concerns of tech users. Furthermore, the principles designed for tech manufacturers often claim to benefit users but primarily focus on compliance with global norms and standards, such as international law, human rights, and general ethics. This approach tends to overlook the perspectives and needs of users regarding how technology should serve them. To address this gap, stakeholders have considered developing AI ethics principles that are region-specific, country-specific, or even sector-specific. This approach ensures that the unique needs and perspectives of different user groups are considered, leading to more tangible benefits for the end users. By tailoring AI ethics principles to the specific contexts in which they are applied, we can create a more inclusive and beneficial framework for all stakeholders involved.

2 Motivation and contribution to propose Central Asian AI ethics principles

The applied field of Artificial Intelligence has demonstrated exponential growth over the past two decades and brought significant challenges in the form of ethical and safety considerations for all the stakeholders. Fortunately, as AI is integrating into modern society, experts consider that it is pivotal to be vigilant towards the ethical implications and to ensure its safe and responsible development and use as well [4, 8–10]. This challenge of ethical incorporation in AI is not limited to any specific region or country; it is a global concern that demands attention and action.

Understanding the demands of this responsible era, many countries worldwide have recognized the need to establish ethical principles to guide the development and deployment of AI systems with a formal law or policy. These legal and semi legal documents contain principles aim to provide a framework for responsible AI development within that country, considering classic normative factors such as fairness, transparency, accountability, and human-centricity. They serve as guidelines to mitigate potential risks associated with AI and ensure that its benefits are realized without compromising societal values and human rights.

Parallel to these state level initiates, many major technology manufacturing companies, often referred to as big tech giants, have also taken steps to define their own ethical principles and frameworks for AI development. It wouldn't untrue to say that these tech giants were the first one to feel the demand of ethical consideration during the development of AI. Until now, the principles proposed are design in a way that they should typically align with broader societal values and address concerns such as algorithmic bias, data privacy, explainability, and the impact of AI on boarder areas of societal concerns such as employment. However, it is important to note that these principles, no matter how diverse they seem, are proposed in a manner that they should meet the expectations of stakeholders involved.

There are more than 100 AI ethics principles that have been developed globally, reflecting the diverse and multifaceted nature of AI ethics. These principles are designed to address various specific contexts, including regional, country-specific, sector-specific, and industry-specific guidelines. Some of them are country- specific and regional-specific, such as Beijing 2019, NGCNGAI 2019, NGCNGAI 2021, Shanghai YoungAI 2019, Smart Dubai 2019, Aotearoa 2020, IA Latam 2019, AIIA 2019 (Australia), Cabinet Office 2018 (UK), Beijing Children 2020, EC 2019, UK MOD 2022, Russia 2022, Australia 2019, Canada 2019, South Korea 2020, and Russia 2019. These principles address the specific cultural, legal, and societal needs of individual countries and are tailored to the unique technological and ethical landscapes of their respective regions.

Some principles are sector-specific which focus on particular fields such as healthcare, education, and finance. Examples include GE Healthcare 2018, which provide guidelines for the healthcare sector, PDPC Compilation 2020 for data protection, and ICDPPC 2018 for data privacy. There are also industry-specific principles designed for corporations and organizations within the tech industry. These include Google 2018, Microsoft 2018, DeepMind 2017, Sony 2018, Tencent 2018, IBM 2018a, IBM 2018b, Adobe 2021, Intel 2017, Vodafone 2019, Telefonica 2018, and Baidu 2018. These guidelines ensure that corporate practices and product development adhere to ethical standards.

Additionally, various local and international organizations and think tanks have published their own sets of AI ethics principles. Some of these include WHO 2021, UNICEF 2020, UNESCO 2021, OECD 2019, G20 2019, Montreal 2018, ITI 2017, FLI 2017, Internet Society 2017, UNI Global Union 2017, Nadella 2016, HLEG 2018, SHAI-ISEAC 2019, JSAI 2017, US IC 2020, US OSTP 2020, Deutsche Telekom 2018, COMEST 2019, DoDDIB 2019, CIGI 2018, Alan Turing Institute 2019, Tieto 2018, The Public Voice 2018, House of Lords 2018, SAP 2018, GER DEC 2019, ITechLaw 2019, Rome Call 2020, PAI 2016, OpenAI 2018, US DoD 2020, NATO 2021, The Future

Society 2017, USACM 2017, Unity 2018, ADP 2018, IEEE 2019, FATML 2016, IBE 2018, NYTimes 2019, US AI Initiative 2019, Sage 2017, Etzioni 2017, and Stanford 2018 [7, 8].

These documents highlight the global effort to establish ethical standards that ensure AI technologies are developed and deployed responsibly, considering the unique needs and values of different regions, countries, sectors, and industries. We believe, in order to ensure the AI being ethical, we need to introduce and intertwin principles across all strata, from broad foundational guidelines to more intricate and even sector-specific ones. Moreover, by customizing AI ethics principles to reflect the unique characteristics and subtleties of local cultures, we ensure they are not just theoretically sound but also practically relevant. The foundation for applying principles tailored to specific subjects or sectors is established by understanding local contexts and by setting broad AI ethics guidelines at national and regional levels. Instead of challenging the pragmatic importance of these principles, we need to introduce glocalized AI ethics principles and incorporate them at all levels and across all domains.

The absence of AI ethics principles originating specifically from Central Asia highlights a significant gap in addressing the unique demands of this region. Central Asian countries often find themselves subject to AI ethics frameworks developed by others. We cannot locate any AI ethics principles being proposed by anyone in this region except for some initiatives suggesting that the region requires its own set of principles (Younas 2020). These external frameworks, while comprehensive, do not adequately account for the distinct cultural, social, and economic contexts of Central Asia. As a region predominantly on the receiving end of AI technologies, Central Asia requires a tailored approach to AI ethics.

The development of Central Asian AI ethics principles is imperative to ensure that the deployment and implementation of AI technologies are aligned with the region's unique characteristics and needs. Such principles would provide a more relevant and effective framework for addressing the ethical challenges and opportunities specific to Central Asia. By establishing region-specific AI ethics guidelines, Central Asian countries can better navigate the complexities of AI integration, ensuring that the benefits of these technologies are realized in a manner that is culturally sensitive and contextually appropriate.

3 A global imperative for responsible development and Central Asia's role

While technologically advanced countries and main tech giants are engaged in proposing AI ethics principles which act as guidelines for smaller countries and companies originating from them, it is crucial to have a sympathy towards the expectations of smaller countries including those in Central Asia. Often, when smaller nations import technology from other countries, they also adopt the associated ethical guidelines coming within the package. Some countries haven't considered it a matter of concern and readily adopt the associated guidelines and ethical principles. This is because adapting the imported technology is often prioritized over ethical integration, which is viewed as a less urgent matter. However, every nation including those in Central Asia has started recognizing the potential impact of AI technologies on their societies, economies, and governance systems and proactively wishes to develop their own set of legal regulations.

Former Soviet Republics include Central Asian countries which include Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan are clearly recognizable as a region, whose member states have more in common with each other than with external neighbors. The five countries share a moderate Islam as majority religion and look back on a common history as former Soviet republics under Russian dominance [9]. Central Asians are introducing new laws related to AI and are engaged in multi-stakeholder discussions involving government bodies, academia, industry experts, civil society organizations, and the public to reap the benefits of AI [10].

Central Asia, because of its strategic position, holds significant importance for major global powers. World has started recognizing that Central Asia can offers a viable alternative for logistical routes and can play a pivotal role in the global economy. It serves as the crossroads between the east and west, boasting the historic trade route known as the Silk Road, which has held substantial importance throughout history. Since the fall of the Soviet Union, Central Asian nations are now rejuvenating their ancient prominence and striving to carve out their unique identities. Their goal is to garner increased attention and acknowledgment from the global community [9, 11, 12].

To address the requirements of the modern tech age and stay attuned to technological advancements, Central Asian governments are not only leveraging technology but also aiming to draw more investments to their nations. They are focusing on enhancing digital infrastructure and building technological capacity at all levels. The objective is to ensure they don't lag behind in this technological epoch. This is the reason that each of the Central Asian country is very conscious towards its international reputation usually projected by international ranking and rating systems.

There have also been some attempts to highlight the necessity of AI ethics principles in Central Asia [13] and its importance for improving Central Asia's image in global tech community. These discussions are helping to identify and prioritize the ethical challenges unique to these

individual countries and the whole Central Asian region. Some of the regional specific challenges include cultural biases, inclusivity, data sovereignty, and the potential impact on economic inequalities which are same as of many other smaller countries with similar demographics as of Central Asia.

One of the main reasons exclusive to the AI ethics principles, not being a matter of immediate concern for Central Asian countries is their inherent diversity. The world, including its neighboring countries, perceives Central Asia as a territory inhabited by a homogenous group of people. However, each of the Central Asian country is unique and have distinctive sociological, economical, demographical and political features. This difference is well demonstrated by their long standing inter-regional conflicts [14–16].

Some scholars even argue that the regionalism has failed in Central Asia because Central Asian countries are unable to build up a unified regional block in relation to extra-regional powers [9], we believe that AI ethics has a potential to integrate Central Asia a strong region needed in contemporary techno world. The development of AI ethics principles in Central Asian countries will not only help in regional integration but also is crucial to foster responsible AI innovation, build public trust, and ensure the technology's benefits are harnessed in a manner that aligns with Central Asia's societal values. By addressing the ethical challenges proactively, Central Asian countries can position themselves as responsible AI adopters, increase understanding among themselves and contribute to the global efforts towards the development of a human-centric and sustainable AI ecosystem.

4 Central Asian AI ethics principles

It is imperative for each country within the region to establish its own set of AI ethics principles. These principles would act as essential guidelines to promote the responsible and ethical utilization of artificial intelligence within their respective territories and also preserve the country-specific positions on AI. When it comes to the range of cultures, values, and societal norms prevalent in Central Asia, it is not very diverse. Majority of the population follows Islam as region which is the considered as a source of social morality [9, 12, 15, 16]. However, it is crucial to customize AI ethics principles in a way that they should not only contribute towards regional integration but should also address the specific local country level considerations. In this regard, the concept of "Nomadic AI ethics principles" was previously introduced, which advocates for all Central Asian countries to formulate their own contextually relevant guiding principles rooted in the inherent values of the Central Asian region [13].

In this paper, we are proposing "Central Asian AI ethics principles", keeping them consistence with globally accepted AI ethics frameworks and expect that Central Asian countries would be able to leverage existing initiatives, guidelines, and best practices from around the world while tailoring them to their own specific needs. These principles will not only aid Central Asia's engagement with the global tech community but will also enable other nations to share knowledge with Central Asia.

1. **Cultural consideration and sensitivity**:

   - AI systems should be designed and used in a way that it should respect and understand the rich tapestry of Central Asian traditions, values, and customs, and their nuances as well to ensuring that they promote collaboration and do not inadvertently marginalize or stereotype any group residing in Central Asian.

2. **Inclusivity:**

   - The expansion of new innovation technologies including AI is spreading its tentacle on all the areas of life so it should have sympathy towards the expectations of all stakeholders interested in the technological development in Central Asia. AI should be inclusive, catering to various local, national and regional languages and also recognize the diverse ethnic, linguistic, and religious backgrounds in Central Asia.

3. **Beneficial and harmless:**

   - AI should be developed and used, not only to enhance the quality of life for Central Asians but also to contribute towards humanity with a shared future and should ensure that the technology does not inadvertently harm or disadvantage any group and nature.

4. **Transparency and accountability:**

   - AI development and deployment should transparent and accountable to facilitate the processes of auditing and monitoring. Given the region's historical context with governance, it's crucial that AI and its development processes be transparent, explainable and predictable.

5. **Openness and collaboration:**

   - To uphold the Central Asia's rich legacy of connectivity and shared knowledge, and to prevent monopoly over data or platforms, AI should be open and promote collaboration. AI should ensure equitable oppor-

tunities for all regions and sectors across Central Asia and beyond. Not only by encouraging inter-country collaboration within Central Asia but also to promote a constructive dialogue with global entities, ensuring that Central Asian concerns are voiced and addressed in global AI ethics discussions.

6. **Sustainable development:**

- AI should be harnessed to address regional challenges, such as environmental issues like the Aral Sea crisis, and should promote the humane sustainable development and protection of climate and biodiversity resources. In order to support the harmonious coexistence of human and nature, the development and use of AI should reduce its own environmental footprint.

7. **Silk Road AI Renaissance:**

- AI should be utilized in a manner that respects and preserves both humanity and nature. Sustained research efforts are required so that the potential risks Augmented Intelligence, Artificial General Intelligence (AGI), Superintelligence and other form of life can be mitigated.

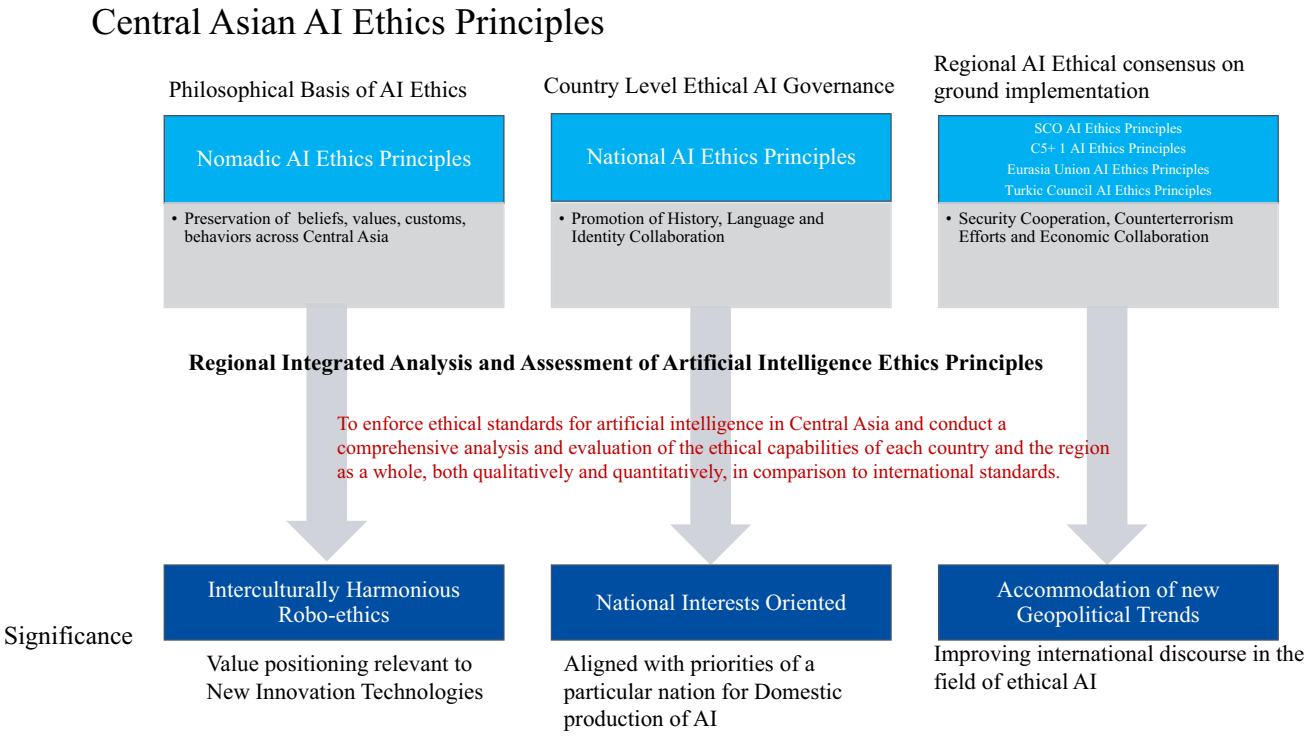
Different Artificial Intelligence Principles are designed with different considerations, and Central Asian countries can adopt them according to their local technological needs and contexts. Some notable initiatives such as Linking Artificial Intelligence Principles can help in visualizing and comprehending major AI ethics principles all over the world. Linking Artificial Intelligence Principles is a platform for integrating, synthesizing, analyzing, and promoting global Artificial Intelligence Principles and their social and technical practices Worldwide, from different research institutes, non-profit organizations, non-governmental organizations, companies, etc. This initiative aims at understanding in which degree do these different AI Principles proposals share common values, differ and complete each other [7]. Central Asian AI ethics principles are a starting point which would need deeper engagement with local experts, stakeholders, and local communities to be fully contextualized appropriately for Central Asia.

5 A multilevel framework for AI ethics development in Central Asia

The development of AI ethics principles at national and regional level can enable tailored considerations that are specific to the local context, history, cultural values, and legal frameworks. It can ensure that the ethical use of AI aligns with the aspirations and needs of the individual respective countries. By engaging in the process of defining AI ethics principles, Central Asian countries can contribute to the global discourse on AI ethics and assert their own stance on responsible AI development. This could be the first step towards the betterment of regional integration.

Some scholars also emphasize the importance of recognizing divergences in AI ethics guidelines, rather than solely seeking common ground [17]. We also align ourselves along these lines. Different AI ethics principles and their differences illuminate underlying conflicts that warrant further discussion. By examining them collectively and establishing connections, we can underscore e key insights that could benefit individual countries [7]. By examining AI ethics through the lens of various stakeholders such as general public, tech expert, and private businesses, it becomes clear that varying priorities shape the overall direction of the debate. Simply focusing on frequently mentioned principles might overlook those that seen difficult to incorporate but are ethically significant. Scholars have argued to highlight the need to embrace value pluralism, accepting the diversity of ethical standpoints as a means to enrich the ongoing discussion on AI ethics [17].

However, we put forth a more comprehensive multilevel framework for the adoption of AI ethics principles that not only meet the specific requirements of each Central Asian country at an individual level but also addresses the broader regional considerations. This framework takes into account the diverse needs and contexts of Central Asian countries and emphasizes the importance of domain-specific and tailored approaches to AI ethics. By adopting this multilevel framework, Central Asian nations can ensure a holistic and inclusive approach to the implementation of AI ethics principles all over the region, encircling the distinct expectations of each country, as well as the collective interests and technological ambitions of the region as a whole.



Our attempt of proposing Central Asian AI ethics principles is a very first effort to provide a starting point to ethically embed Artificial Intelligence in the technological infrastructure of Central Asia. We advocate for the upholding of traditional beliefs, values, customs, and behaviors of Central Asia and that is why, these principles are philosophically rooted in the Nomadic AI ethics principles. Parallel to this, at a national level, we emphasize on the promotion of the region's rich history, language, and collaborative identity. Furthermore, a regional collaboration in AI is fostering which demands regional level AI ethics principles. Central Asia is a part of various coalitions and regional organizations which are promoting or expected to have regional level cooperation in AI and may need to form a consensus on implementing AI ethics on regional level. Shanghai Cooperation Organization, Economic Cooperation Organization, Turkic Council, C5 + 1 and other regional organizations are actively engaged in mobilization of region's resources including collaboration on AI. To best utilize the region's own technological resources and to effectively implement these AI ethics principles at all levels, an integrated analysis and assessment is also required. So that the stringent ethical standards tailored for Central Asia could be enforced. The assessment should be comprehensive which could delve deep into both qualitative and quantitative aspects of AI ethics within each country and the region as a whole while benchmarking against global standards.

6 Regional level AI ethics principles

Central Asia has numerous regional organization which are already working in various domains of economic and social cooperation [14, 16] To promote the shared regional interests and to highlight their own individual local nuances, Central Asian countries need to conceptualize regional AI ethics principles as well. Collaborating on regional AI ethics frameworks can enhance unity among individual countries and allows Central Asia to present a unified stance in global AI ethics discussions. Examples of such regional-level principles include the SCO AI ethics principles, C5 + 1 AI ethics principles, Eurasia Union AI ethics principles, Turkic Council AI ethics principles, and similar frameworks under the flagship of various regional organizations.

This comprehensive framework aims to guide the development of these AI ethics principles, highlighting the need for stakeholder collaboration. This approach has the potential to empower Central Asia to harness AI's benefits responsibly, safeguard citizens' rights, and contribute effectively to global AI ethics debates, ensuring a balanced and ethical AI ecosystem. It can allow Central Asian countries to present a cohesive and coordinated stance towards new innovation technologies while actively contributing to the global discourse on AI ethics as a regional bloc.

7 Sector-specific AI ethics principles

In addition to the individual and regional principles, individual Central Asian countries can undertake the development of sector-specific AI ethics principles to overcome the ethical issues related to AI in the specific domains. These principles would specifically cater to key areas of focus within each country, encompassing domains such as military, science, climate change, sustainable development, healthcare, education, and governance. Scholars have already been calling for cross-cultural cooperation that does not require agreement on principles and standards for all areas of AI but advocate for reaching agreements on more practical issues to reach at a cross-cultural or regional agreement [18]. By introducing ethical frameworks to these specific sectors, Central Asian countries can effectively address the challenges and opportunities arising from the implementation of AI in these specific sectors.

Sector-specific AI ethics principles provide targeted guidelines that ensure the adherence to ethical practices and responsible deployment of AI technologies in critical domains such as climate change and biodiversity. Scholars have proposed numerous toolkits to support ethical AI development across various subjects and domains [19]. Moreover the data indicates that the AI ethics field would benefit from an increased focus on ethical analysis grounded in concrete use-cases, people's experiences, and applications as well as from approaches that are sensitive to structural and historical power asymmetries [20]. That is why, it is importance to integrating guideline-development efforts with substantive ethical analysis without ignoring the adequate implementation strategies [21]. These sector-specific AI ethics principle will not only help in strengthening overall AI ethics framework within the specific country but also will help in navigating across same domains in other Central Asian countries.

8 Exemplary Central Asian AI ethics principles for biodiversity conservation

To illustrate the practical application of regional-specific, country-specific and sector-specific AI ethics principles, we employ the example of biodiversity conservation. This example demonstrates how region-specific, country-specific, and sector-specific principles can be effectively integrated within a comprehensive AI ethics framework to address distinct challenges and requirements.

In Central Asia, biodiversity is not only foundational for the livelihoods and socioeconomic wellbeing of communities, it also shapes people's culture and identities [22]. A well-maintained biodiversity is essential for a living planet, and is the basis for the survival and development of humanity. Protecting biodiversity contributes to the viability of Earth, and promotes the harmonious coexistence and sustainable development of human beings and nature [23]. AI ethics principles should be drafted to promote biodiversity conservation and to ensure that adequate habitats of all life forms is not endangered due to the development of AI. Alongside biodiversity, addressing global climate change is essential for the sustainable future of humanity and ecology. The stakeholders of new innovation technologies especially AI in Central Asia should deeply collaborate with stakeholders of climate change and ecosystems to contribute to the implementation of the global climate agenda [24].

Given the unique ecological landscapes and biodiversity challenges faced by Central Asian countries, it is essential to develop AI ethics principles that address the specific needs of each nation. The following examples illustrate how AI can be leveraged to conserve biodiversity across different ecological zones within Central Asia.

Kazakhstan's Steppe Conservation: Develop AI models focusing on preserving the biodiversity of Kazakhstan's steppes, addressing issues such as overgrazing and habitat fragmentation.

Uzbekistan's Desert Ecosystems: Apply AI to monitor and protect the biodiversity of Uzbekistan's desert ecosystems, particularly in response to climate change and desertification.

Kyrgyzstan's Mountain Biodiversity: Use AI to support the conservation of Kyrgyzstan's mountain biodiversity, focusing on species monitoring and habitat preservation in high-altitude environments.

Tajikistan's Highland Biodiversity: Implement AI-driven conservation efforts to protect Tajikistan's unique highland ecosystems, ensuring the preservation of endemic species and mitigating the impacts of climate change.

Turkmenistan's Desert and Oasis Ecosystems: Utilize AI to safeguard the biodiversity of Turkmenistan's desert and oasis regions, focusing on water conservation, habitat protection, and sustainable land use practices.

Considering this context, AI ethics principles for biodiversity conservation in Central Asia should focus on the following areas:

Preservation of Unique Ecosystems: AI applications must prioritize the conservation of Central Asia's unique ecosystems, such as the Tien Shan mountains, Aral Sea region, and the steppes.

Combatting Illegal Wildlife Trade: Utilize AI to monitor and prevent illegal wildlife trade that threatens local species, leveraging region-specific data and patterns.

Sustainable Land Use: Implement AI tools that support sustainable land management practices, accounting for the specific agricultural and pastoral practices in the region.

Protecting biodiversity contributes to the viability of Earth and promotes the harmonious coexistence and sustainable development of human beings and nature. AI ethics principles should ensure that AI technologies are developed and used in ways that do not harm or disadvantage any group or natural habitat. Furthermore, addressing global climate change is essential for the sustainable future of humanity and ecology. Stakeholders in new innovation technologies, especially AI in Central Asia, should collaborate deeply with climate change and ecosystem stakeholders to contribute to the implementation of the global climate agenda.

This context underscores the necessity for Central Asia to develop AI ethics principles at multiple levels: regional, country-specific, and sector-specific. At the regional level, unified principles can address shared environmental challenges and promote collective action. At the country level, tailored guidelines can reflect the unique ecological and cultural contexts of each nation. Finally, sector-specific principles can ensure that AI applications in areas such as agriculture, forestry, and tourism support biodiversity conservation effectively. By developing these layered principles, Central Asian countries can ensure responsible and effective use of AI technologies to protect and preserve their rich biodiversity, while also contributing to global efforts towards sustainable development and climate action.

9 Conclusion

In this study, we have proposed AI ethics principles for Central Asis that are region-specific guidelines correlating with the unique historical, cultural, and social peculiarities of each of the Central Asian country. In the global AI ethics discourse, it has become evident that a one-size-fits-all approach to AI ethics can be ineffectual. That is why we call upon the necessity for a tailored approach for each country and region. Central Asia serves as a particularly poignant example, with its absence of established AI ethics principles. By proposing principles tailored to Central Asia, we not only pave the way for more responsible AI deployment but also highlight the broader potential benefits, such as fostering regional integration and technological advancement. Our primary assertions are that the full potential of AI ethics principles can only be realized when they are deeply entrenched at every level—national, regional, and global, and across all facets of life. Such holistic integration can catalyze tangible results and benefits for Central Asian society. Furthermore, the adaptation and incorporation of these AI ethics principles into diverse sectors, including biodiversity, climate change, and sustainable development, can amplify their positive impact. We strongly urge stakeholders from all walks of life within and outside Central Asia to further this dialogue, research, and practical application, ensuring that the exponential growth of AI is matched by an equally rigorous ethical foundation. Finally, this paper serves as a blueprint, not only for Central Asia but inspire other regions to tailor and implement AI ethics principles that resonate with their unique contexts.

Author contributions This paper has been a collaborative effort, which emerged from joint discussions. Both authors took part in discussing the paper's contents and structure. A.Y. conceived of the notion of conceptual adaptation; Y.Z. contrasted it with conceptual amelioration. A.Y. has done the writing and editing of the final manuscript.

Data Availability Not applicable.

Declarations

Conflict of interest The authors declare no competing interests.

Declaration of AI and AI-assisted technologies in the writing process During the preparation of this work, the authors used ChatGPT in order to improve the readability and language of the work. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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