Card-Based Approach to Engage Exploring Ethics in AI for Data Visualization

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Figure 1: Three examples of AI-VIS EthiCards showcasing the front and back designs. Each card provides a brief, thought-provoking scenario or question to facilitate ethical discussions in the realm of AI for data visualization.

ABSTRACT

We present AI-VIS EthiCards, a card-based approach to explore ethics tailored for AI for visualization. The continuous integration of artificial intelligence and data visualization has brought about increased efficiency and benefits, yet inevitably raises ethical concerns. The emerging field of AI for visualization is marked by its inherent complexity, making it crucial for researchers, designers, and practitioners to cultivate ethical literacy and contemplate moral obligations within this intricate environment. These cards aim to aid users in learning, discussing, and reflecting on the ethical dilemmas that may arise from the integration of AI technology and visualization. The AI-VIS EthiCard set contains six themes: *Goals, AI-VIS Tasks, Technologies, Ethical Principles, People-In-Focus,* and *Challenges*, proposes various modes of use, including theoretical exploration, and design development simulations, with five activities. We aim to offer users an exploratory and open approach to discussions, providing multiple perspectives to guide ethical considerations when applying AI for visualization. The full set of cards is available at *https://aivisethicards.github.io/*.

CCS CONCEPTS

• **Human-centered computing** → *Visualization theory, concepts and paradigms*; **Information visualization**; • **General and reference** → **Surveys and overviews**; **Design**.

KEYWORDS

Ethics, Data visualization, Artificial intelligence, Card, Education

1 INTRODUCTION

In recent years, applying Artificial Intelligence (AI) techniques for visualization data has marked a significant evolution, offering both advanced capabilities and new complexities. This fusion, known as AI4VIS, has the potential to automate and enhance various aspects of visualization, reducing the traditional reliance on extensive human effort and specialized knowledge in fields like data analysis and visualization design [53]. AI4VIS spans diverse applications, for example, by generating real-world data-backed answers in the form of visualizations through simple natural language queries (e.g., [4, 17, 44]), supporting clinical management of cancer with deep machine learning algorithms and visualization [35], and using machine learning based approach to visualization recommendation [30].

However, the advent of AI in visualization introduces critical ethical dilemmas, highlighted by issues of information asymmetry [42] and increased difficulties in practitioners' comprehension of these AI-infused technologies [51]. Insufficient consideration of ethics can lead to various issues such as algorithmic bias, political interference, misinformation, online hate, human vulnerabilities, and more [18, 31]. The lack of ethical obligations in collecting and visualizing data can result in 'cruel' and 'inhumane' visualizations, marginalization of minority groups, and the triggering of political biases [16, 23]. In practice, the integration of AI in data mining to visualization processes can lead to ethical considerations being inadvertently overlooked or influenced. This risk persists even when researchers and practitioners aim to leverage AI4VIS for socially beneficial purposes. Often, unawareness and unconsciousness, or the pursuit of system efficiency, convenience, and profitability can overshadow the importance of ethical practices.

As AI and visualization authoring tools become increasingly accessible to a broader range of people beyond just researchers and professionals, the need for accessible education on ethical decision-making in this domain becomes more urgent. While there are existing guidelines and principles for the ethical use of AI [31, 32, 38], human-computer interaction (HCI) [41], data [21], and visualizations [16], there is a noticeable lack of comprehensive educational resources that specifically address the ethics in AI4VIS. This gap is particularly challenging given the interdisciplinary nature of this field. To effectively understand and engage in discussions about ethics within AI4VIS, multifaceted attributes are needed. This includes a foundational understanding of the underlying technology, sensitivity to moral and social issues, and the ability to anticipate the impact of design choices on diverse populations. Cultivating such facets is essential for fostering a holistic approach to ethical decision-making in developing and using AI4VIS.

To tackle this challenge, we design AI-VIS EthiCards and activities to facilitate inquiry and discussion around pertinent ethical issues. Drawing on prior research that underscores the effectiveness of card-based methods in enhancing learning and reflection on ethical dilemmas [11, 13], adopting an interdisciplinary framework, and reviewing the literature regarding ethical discourse in AI and data visualization, our cards are structured with six distinct types–*Goal Cards, AI-VIS Task Cards, Technology Cards, Ethical Principle Cards, People-In-Focus Cards, Challenge Cards*, encompassing specific objectives and tasks inherent in AI for data visualization, the technologies involved, and general and fundamental ethical principles and challenges that may arise, with various people. To aid practical application, we designed five activities, *Ethical Exploration and Debate, Design and Development Simulation, Role-Playing and Perspective-Taking, Scenario Development and Storytelling, Learning and Application,* enabling participants to deeply engage with and reflect upon the ethical dimensions of AI4VIS technologies and dilemmas. Our primary aim with AI-VIS EthiCards is to foster a thoughtful approach toward encouraging the responsible design and use of AI4VIS and reducing negative societal impacts. Our approach demonstrates the value of interdisciplinary insights in navigating the ethical landscape of AI4VIS.

2 RELATED WORK

2.1 AI for Data Visualization

AI and visualization are not just coexisting but are interdependent and enrich each other. Recent surveys on AI and visualizations provide a comprehensive understanding of goals, tasks, processes, and applications. Wang et al. [52] discuss the complementary strengths of visualization and AI in complex data analysis scenarios, and propose a framework of VIS+AI, emphasizing the potential for AI to learn human intelligence through interactions and communicate via visual interfaces. Wu et al. [53] offer a broad survey of AI applications in managing and enhancing traditional visualization processes (AI4VIS), identify three goals of applying AI to visualization data, and describe task abstraction encompassing Transformation, Assessment, Comparison, Querying, Reasoning, Recommendation, and Mining. With a specific focus on the application of machine learning, a subset of AI, in visualization (ML4VIS), Wang et al. [51] outline ML technologies used for related tasks and identified seven key processes through which visualization benefits, such as Data-VIS Mapping, Insight Communication, VIS Reading. From the perspective of human-AI collaboration, Li et al. [37] conduct a systematic review, exploring how artificial intelligence aids in telling data stories. Existing research highlights important research questions, methods, and challenges in utilizing AI to support the visualization process. To provide an overview of *what* and *how* to apply AI technologies to assist or enhance the visualization process, we borrow the goals and task abstraction described by Wu et al. [53], which offers a clear and structured framework of how AI enhances traditional visualization processes that are highly relevant to the objective of our card design.

2.2 Ethics for AI and Visualization

Ethical issues in AI refer to problems and risks arising from the development, deployment, and use of AI [31]. Many ethical issues, such as lack of transparency, privacy and accountability concerns, biases and discrimination, security and safety issues, and the potential for criminal and malicious use, have been identified in applications and research [2, 48]. Reflections have been implemented on principles in ethical decision-making by autonomous systems [6, 24, 46, 54], and meta-studies of AI ethics contribute further to the discourse [12, 26, 28, 43, 49]. Jobin et al. [32] conduct a systematic scoping review of all the existing literature on AI ethics and compile 11 ethical principles including Transparency, Justice and fairness, Non-maleficence, Responsibility, revealing the ethical requirements and principles AI needs. However, the *implementation* of ethical guidelines in the research and practice is still an area to be explored, requiring a focus on balancing between the technical discourses, and social and personality-related aspects [29].

In the realm of ethical issues in data visualization, Correll [16] delves into design dilemmas by combining themes of automated analysis, machine learning, and provenance and presents ethical challenges related to visibility, privacy, and rights. D'Ignazio et al. [23] articulate six core principles of feminist data visualization, highlighting the issue of power imbalances in the design and output of data visualization processes. Additionally, some research approaches the exploration of ethical dimensions in visualization

from specific aspects, such as values and assumptions [22], empathy [36], the deception and misinformation [14], and steps on the process of storytelling [20]. While ethical issues have been largely discussed in isolation in AI and data visualization, fostering ethics effectively in AI4VIS requires a holistic approach that combines these ethical considerations.

2.3 Card-Based Approach for Ethics

Card-based design tools have been widely used in HCI research [1, 45]. They are described as 'tangible idea containers, triggers of combinatorial creativity, and collaboration enablers' [39, p.75]. The current application of cards as a method for reflecting on ethical issues includes: *Human-AI Interaction Guidelines* [5] aiding brainstorming and evaluation of ethical issues in HCI and UX design; *Privacy Ideation Cards* [40] focusing on privacy issues to enhance participants' sensitivity to information privacy laws; *Tarot Cards of Tech* [7] reflecting on the potential social impacts of technology; exploring inherent ethical dilemmas in machine learning [11]; *Anti-Bias Cards* [13] uncovering biases in various aspects of technology project lifecycles; and *AI Audit Card* [3] for cultivating AI literacy by understanding the ethical and social impacts of AI systems. The effectiveness of card-based methods has been proved with diverse groups (e.g., HCI designers [40] and high school students [11]) to help participants learn and reflect on ethical dilemmas in technology and design processes, even for those who are not familiar with technical topics. In this paper, we present a framework for integrating insights from AI ethics, data visualization, HCI, and education embodied in the AI-VIS EthiCards, which offers a novel approach for connecting abstract ethical principles with their practical implementation in AI4VIS.

3 METHODS

Initially, to identify the aspects and themes involved in ethics and AI4VIS, we conducted a literature review by searching for surveys related to ethics in AI and data visualization. In the first phase, our search focused on AI ethics and visualization ethics using four databases: ACM, IEEE, Google Scholar, and Semantic Scholar. This search led to 12 relevant survey papers based on reviewing titles and abstracts. We expanded our corpus through the forward and backward snowballing of references in these seed papers. In the second phase, we broadened our search to include keywords like 'AI ethics', 'data science ethics', 'visualization ethics', and 'design ethics'. This process involved discovering aspects (e.g., technology, people) and identifying themes under each aspect to facilitate a comprehensive examination of the convergence among ethics in AI, data, visualization, and design. We collected 60 papers from the two search phases, forming the foundation of our research and informing our subsequent steps.

After reviewing the literature, the co-authors engaged in a series of discussions to develop a framework with aspects and themes that support both discussing and learning, especially for newcomers to AI4VIS and ethics. We acknowledged the importance of analyzing dilemmas from various perspectives as crucial to critical thinking [27]. Aiming to design engaging activities, we revisited the identified themes from the literature and determined the essential knowledge and prompts needed for effective participation in

activities. Our goal was to create cards that are **i)** easy-to-use, **ii)** accessible without prerequisite expertise, and **iii)** flexible across multiple applications, including brainstorming, educational settings, and self-reflection. Our design and discussions were guided by these goals.

In refining our AI-VIS EthiCards, we iterated on card types, language, and visuals. Our initial framework included AI-VIS Tasks, Challenges, People-In-Focus, Technology, Principles, Cases, and Scenarios. Through iterative refinement and considering various usage scenarios, we decided to omit Scenarios and Cases to serve ad-hoc needs and adaptability. The card content, based on the literature review, was refined for clarity and broader accessibility by simplifying technical language. In addition to our initial literature review, we actively search for examples and insights from other sources to facilitate comprehension of concepts, incorporating relevant references directly onto the corresponding cards. The collaborative effort of co-authors from fields including visual design, information visualization, data-driven storytelling, and computer science further enriched the card designs.

4 AI-VIS ETHICARDS

The card set encompasses 62 cards across six types: Visualization Goal Cards, AI-VIS Task Cards, Technology Cards, Ethical Principle Cards, People-In-Focus Cards, and Challenge Cards. Each card, detailed in Table 2 and examples illustrated in Figure 1, includes descriptions, examples, and questions pertinent to its theme. The design of the cards features concise descriptions to convey the core concepts with color coding and icons for easy identification.

Goal Cards: The Goal Cards are designed to facilitate focused discussions on the application of AI4VIS projects to contemplate potential outcomes and conceptualize AI4VIS projects. The structure of our Goal Cards is informed by Wu et al. [53], who identified three primary goals: Visualization Generation, Visualization Enhancement, and Visualization Analysis.

AI-VIS Task Cards: The AI-VIS Task Cards are derived from common tasks for applying AI to visualization data [53]. Introducing participants to various AI4VIS tasks aims to facilitate a better understanding of these technologies for ethical considerations involved, and encourages thoughtful analysis of their implications within a broader context. The seven tasks include Transformation, Assessment, Comparison, Querying, Reasoning, Recommendation, and Mining.

Technology Cards: AI4VIS exists across different technologies, each comes with its unique design considerations and ethical implications. Derived from a review of technology types as the target of ethics discussions by Vilaza et al. [41], including mobile and web applications, social networks and forums, games, etc., and we added VR/AR technologies.

Ethical Principle Cards: The ethical principles introduce ethical values into design and discussions while identifying hidden values of other participants [34]. We refer to a global survey conducted by Jobin et al. [32] on ethical principles and guidelines for AI, highlighting 11 key ethical principles: Transparency, Justice and Fairness, Non-Maleficence, Responsibility, Privacy, Beneficence,

Card Types	Content
Goal Cards	**Visualization Generation**: outputs single or many visualizations given different user inputs. **Visualization Enhancement**: processes and applyment to an input visualization. **Visualization Analysis**: concerns organizing and exploiting visualization collection.
AI-VIS Task Cards	**Transformation**: coverts visualization data from one modality (e.g., graphics) to another (e.g., program). **Assessment**: measures the absolute or relative quality of a visualization in terms of scores or rankings. **Comparison**: estimates the similarity or other metrics between two visualizations. **Querying**: finds the target visualization relevant with a user query within visualization collections. **Reasoning**: challenges AI to interpret visualizations to derive high-level information like insights and summaries. **Recommendation**: automates the creation of visualizations by suggesting data and/or visual encodings. **Mining**: discovers insights from visualization data bases. Most of those tasks originate from well-known terminology.
Technology Cards	**Mobile and web applications** (e.g., personal health, services). **Social networks and forums** (e.g.,crowd-sourcing, social media). **Public installations and displays** (e.g.,ambient displays, data murals, data sculptures, installations). **Internet of Things (IoT)** (e.g.,smart spaces, smart TVs, educational tools, in general). **Wearables and biosensors** (e.g.,biosensing, fashion technologies, body integration). **Games** (e.g.,playful narratives, virtual reality, for leisure, with cultural references, multiplayer). **Broadcast media** (e.g.,video streaming platforms, documentaries, news media). **Data repositories** (e.g.,historical archives, DNA repositories, learning analytics, in general). **VR/AR technologies** (e.g.,in general). **Others** (e.g.,shape-changing interfaces, end-of-life technologies, drones).
Principle Cards	**Transparency**: transparency, explainability, explicability, understandability, interpretability, communication, disclosure, showing). **Justice and fairness**: justice, fairness, consistency, inclusion, equality, equity, (non-)bias, (non-)discrimination, diversity, plurality, accessibility, reversibility, remedy, redress, challenge, access and distribution. **Non-maleficence**: non-maleficence, security, safety, harm, protection, precaution, prevention, integrity (bodily or mental), non-subversion. **Responsibility**: responsibility, accountability, liability, acting with integrity. **Privacy**: privacy, personal or private Information. **Beneficence**: benefits, beneficence, well-being, peace, social good, common good. **Freedom and autonomy**: freedom, autonomy, consent, choice, self-determination, liberty, empowerment. **Trust**: trust. **Sustainability**: sustainability, environment (nature), energy, resources (energy). **Dignity**: dignity. **Solidarity**: solidarity, social security, cohesion.
People-In-Focus Cards	**Age variations** (e.g., children, teenagers and elderly). **Workers with different needs** (e.g., Amazon Mechanical Turk workers, musicians, Uber drivers and home health aides). **People with health conditions** (e.g., neurological illnesses, mental health diagnosis, substance addiction, cancer). **Marginalized** (e.g., gender variations, racial variations, various challenges such communication and/or mobility). **Situational variations** (e.g., rural, homeless). **Non-human** (e.g., animals).
Challenge Cards	**Design Dilemmas - Input Questions** · How much guidance should analytics systems provide to users? · How prescriptive should such systems be in forbidding or advising against actions that are likely to lead to statistically spurious conclusions? · How much abstraction or approximation should we use when communicating complex ML models? · What standards or expectations should we cultivate when choosing to visualize algorithmic decision-making? · How, and how many, alternate design or analytical decisions should we surface to the user? · Should we audit or structure the provenance of a visualization in order to surface irregularities? · How do we visualize hidden uncertainty? · How to visualize hidden impacts? · How to visualize hidden labor? · How much data is "enough"? · How to anthropomorphize data? · How to obfuscate data to protect privacy? · How to support data "due process"? · Should we rethink binaries? · Is diversity embraced in the process? · How to examine power and empower? · How to consider context? · How to legitimize embodiment and affect, act as data advocates? · We ought to pressure or slow unethical analytical behavior. **Design Dilemmas - Output Questions** · Rethink binaries? · Embrace pluralism? · Examine power and aspire to empowerment? · Consider context? · Legitimize embodiment and affect? · Make labor visible?

Figure 2: The full list of AI-VIS EthiCards includes six card types and 62 cards in total.

Freedom and Autonomy, Trust, Sustainability, Dignity, and Solidarity. We included explanations on the card to facilitate comprehension.

People-In-Focus Cards: Involving People-In-Focus in the thought process helps participants analyze how relevant procedures are implemented with a human-centric focus. This set of cards is derived from Vilaza et al. [41]'s review of where end-users have raised design questions and considerations of ethics in HCI. Since the categorization from the original paper was for summarizing themes identified from the literature, to adapt them to be used for activities and discussions on cards, we combined 'Older Adults' and 'Children and Teenagers' as 'Age Variations', classified 'Women' to a 'Marginalized' that include gender variations, racial variations, various challenges such communication and/or mobility, classified 'Rural population' to 'Situational variations (e.g., rural, homeless)'. Additionally, we exemplified the needs of people-in-focus to aid thinking, such as posing ethical questions for the children and teenagers group, like 'How is children's information collected? For example, children may feel comfortable with some form of parental monitoring but resist monitoring that is constant or imposed on them with little explanation [33]. Trust issues may arise when children discover that data is being used without their knowledge [50]'.

Challenge Cards: The Challenge Cards are designed to spotlight ethical dilemmas in the application of AI4VIS. We drew inspiration from ethical dilemmas in applying machine learning to data visualization [16] and integrated issues encountered in visualization itself [23]. These cards present multifaceted ethical dilemmas to aid users in identifying and reflecting upon complex challenges. In the spirit of D'Ignazio et al.'s approach to classifying dilemmas as *Design Process Questions* and *Design Output Questions*, we structured the Challenge Cards into *input* and *output* sections. For each card, we provided a brief, relevant case or scenario for each question to illustrate the dilemma. For example, 'How much guidance should analytics systems provide to users? Systems that seek to automatically locate 'insights' in datasets can save time for users and assist users without strong backgrounds in statistics. However, they can promote noise over signal and lead to unjustified conclusions. How do we empower users without supporting potentially dangerous decision-making?' The format of the cards encourages users to thoughtfully engage with the content, integrating it into wider conversations about system design and ethical decision-making.

5 ACTIVITIES WITH AI-VIS ETHICARDS

The AI-VIS EthiCards are designed for a range of uses in both educational and professional settings. For example, using the cards to help students analyze ethical risks in AI4VIS, assist developers in ethical system design, or enable project teams to discuss ethical issues with stakeholders. We propose five flexible activities, suitable for academic or industry contexts. These activities can be tailored to specific needs and adaptable to other scenarios.

Ethical Exploration and Debate: Conflict and debate through card-based activities are proven catalysts for innovation, as seen in the development of tools like the *Grow-A-Game card* for evaluating games [9, 10] and the *Behavior Change Design Sprint* for ethical design discussions [15]. This activity is designed to engage

participants in critical thinking and to develop a multifaceted understanding of ethical issues at the intersection of AI and visualization.

Activity Description (How to Use) Participants start by drawing Challenge Cards, each illustrating a unique ethical dilemma with associated discussion prompts. To structure their thinking, participants then select Ethical Principles Cards relevant to the challenges presented. In small groups, they use these principles to guide a focused discussion on the dilemmas. For the debate component, each group is divided into subgroups representing different perspectives or stakeholders related to the ethical issue. Subgroups are given time to prepare arguments that reflect their assigned viewpoint, based on the Ethical Principles Cards. A moderator is assigned to facilitate the debate, ensuring that each subgroup has equal opportunities to present their arguments and rebuttals. The activity concludes with a reflection session where participants discuss the different viewpoints presented, evaluate the strength of arguments, and consider how ethical principles can be applied to resolve dilemmas in practice. The goal is to synthesize a holistic understanding of the ethical issues and potential resolutions by combining different perspectives.

Design and Development Simulation By crafting narratives that explore the ethical implications within these imagined scenarios, participants are essentially engaging in a *design fiction* exercise to investigate and reflect on the role and impact of AI4VIS, as well as the broader societal and ethical considerations. This activity mirrors the pedagogical approach facilitating high school students designing machine learning applications [11], and sketching visualization designs based on the prompts with Visualization Futures Cards [8].

Activity Description (How to Use) Participants are divided into small teams, each drawing from a set of AI-VIS Task Cards, Goal Cards, Challenge Cards, and Technology Cards to draft an AI4VIS project, integrating ethical considerations from the onset. They outline project goals, address challenges, and decide on technologies, weaving ethical principles and people-in-focus into their planning. Following the project's conceptualization, teams present their plans and engage in a group critique, offering and receiving feedback on the ethical integration within their designs. The session concludes with a reflective discussion, synthesizing insights on how ethical considerations can be pragmatically incorporated into real-world AI and visualization initiatives. This exercise aims to elevate participants' ethical awareness and their ability to navigate dilemmas in AI4VIS project planning.

Role-Playing and Perspective-Taking: Transforming ethical challenges into playable role-playing scenarios can increase students' interest in ethical issues in digital simulation [47]. Previous studies have used card-based role-playing to teach children about AI's societal impact, where they played as business owners using AI tools, teaching them to appreciate diverse viewpoints and understand AI's societal ramifications [3].

Activity Description (How to Use) Participants are given roles through People-In-Focus Cards, representing people involved in AI4VIS work. They are then presented with ethical scenarios via Challenge Cards. Participants engage in role-play, responding to these scenarios based on their assumed roles from the People-In-Focus Cards and using Ethical Principles Cards as a moral compass. The activity culminates in a group discussion that dissects the

various perspectives and formulates potential solutions. This interactive exercise aims to deepen participants' understanding of ethical dilemmas and foster a sense of empathy by exploring the impact of AI4VIS from the standpoint of various people in focus.

Scenario Development and Storytelling: With a similar spirit of activities with Envisioning Cards [25] to aid in developing scenarios for designing interactive systems, and activity with Security Cards [19] finding a news article that related to a drawn card. Envisioning scenarios and telling stories leverage the AI-VIS EthiCards to craft narratives that illuminate the multifaceted ethical considerations in AI4VIS.

Activity Description (How to Use): Participants combine Challenge Cards, Technology Cards, and AI-VIS Task Cards to construct a detailed scenario or story. Ethical Principles Cards are then employed to dissect and examine the ethical aspects of these scenarios. The activity unfolds as participants narrate their stories and dissect the ethical nuances, culminating in a group discussion that delves into these analyses. This method promotes engagement with ethical issues through creative storytelling, offering a richer understanding of the ethical landscape in AI4VIS contexts and its practical implications.

Learning and Application: This approach aided students or practitioners in learning to apply ethical concepts directly to their existing works, critically analyzing dilemmas, and developing solutions that embody ethical values in real-world situations.

Activity Description (How to Use): This activity differs from other activities by focusing on the application of the Ethical Principles Card(s), which participants select as the most relevant to the identified challenge. The ensuing discussion centers on the pragmatic application of these principles, as participants deliberate on actionable solutions and strategies to navigate the ethical challenge. This process is enriched by group dialogues or feedback sessions, where insights are shared, and ethical reasoning is collaboratively refined. It is designed to promote ethical decision-making skills that extend beyond theoretical analysis, focusing on the practical and educational aspects of ethics.

6   CONCLUSION AND FUTURE WORKS

Our research delved into the burgeoning field of applying AI4VIS, examining the intersections of ethics in AI visualization, data, and design. This exploration led to the development of the AI-VIS EthiCard, a tool facilitating nuanced ethical discussions among researchers, practitioners, and users in the field. The card set, featuring a range of modes of usage, offers a framework for ethical reflection, addressing the gap in current interdisciplinary research and practice regarding the systematic organization of ethical norms in AI4VIS.

The initial development phase, which included a literature review and brainstorming, underscored the need to incorporate diverse perspectives for tool enhancement. Recognizing that the effectiveness of the cards depends on various factors, such as their context of use and the characteristics of different participant groups, indicates a need for ongoing evaluation, refinement, and iteration. To address this, we plan to organize workshops with participants from disciplines like ethics, data science, visualization design, and practitioners from other domains to iterate the cards and activities.

Additionally, we aim to use online questionnaires on our website to collect ideas and feedback (*https://aivisethicards.github.io/*), ensuring the development process benefits from a global and multifaceted perspective.

In summary, the AI-VIS EthiCards mark a stride in ethical discourse within AI4VIS. We invite individuals from diverse communities – educators, designers, technologists, and beyond – to apply the cards in innovative ways and contribute to the evolving narrative of ethics in AI and data visualization.

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