Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI

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ABSTRACT
Artificial intelligence (AI)-based technology has achieved many great things, such as facial recognition, medical diagnosis, and self-driving cars. AI promises enormous benefits for economic growth, social development, as well as human well-being and safety improvement. However, the low-level of explainability, data biases, data security, data privacy, and ethical problems of AI-based technology pose significant risks for users, developers, humanity, and societies. As AI advances, one critical issue is how to address the ethical and moral challenges associated with AI. Even though the concept of “machine ethics” was proposed around 2006, AI ethics is still in the infancy stage. AI ethics is the field related to the study of ethical issues in AI. To address AI ethics, one needs to consider the ethics of AI and how to build ethical AI. Ethics of AI studies the ethical principles, rules, guidelines, policies, and regulations that are related to AI. Ethical AI is an AI that performs and behaves ethically. One must recognize and understand the potential ethical and moral issues that may be caused by AI to formulate the necessary ethical principles, rules, guidelines, policies, and regulations for AI (i.e., Ethics of AI). With the appropriate ethics of AI, one can then build AI that exhibits ethical behavior (i.e., Ethical AI). This paper will discuss AI ethics by looking at the ethics of AI and ethical AI. What are the perceived ethical and moral issues with AI? What are the general and common ethical principles, rules, guidelines, policies, and regulations that can resolve or at least attenuate these ethical and moral issues with AI? What are some of the necessary features and characteristics of an ethical AI? How to adhere to the ethics of AI to build ethical AI?

KEYWORDS
AI Ethics, Artificial Intelligence, Ethical AI, Ethics, Ethics of AI, Machine Ethics, Roboethics

1. INTRODUCTION

Some researchers and practitioners believe that artificial intelligence (AI) is still a long way from having consciousness and being comparable to humans, and consequently, there is no rush to consider ethical issues. But AI, combined with other smart technologies such as robotics, has already shown its potential in business, healthcare, transportation, and many other domains. Further, AI applications are already impacting humanity and society. Autonomous vehicles can replace a large number of jobs, and transform the transportation and associated industries. For example, short-haul flights and

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hospitality services along highways will be impacted if driverless cars enable passengers to sleep and work during the journey. AI-recruiters are known to exhibit human biases because the training data inherits the same biases we have as humans. The wealth gap created by the widening differences between return on capital and return on labor is posed to create social unrest and upheavals. The future of work and future of humanity will be affected by AI and plans need to be formulated and put in place. Building AI ethically and having ethical AI are urgent and critical. Unfortunately, building ethical AI is an enormously complex and challenging task.

1.1. What is Ethics?

Ethics is a complex, complicated, and convoluted concept. Ethics can be defined as the moral principles governing the behaviors or actions of an individual or a group of individuals (Nalini, 2019). In other words, ethics are a system of principles or rules or guidelines that help determine what is good or right. Broadly speaking, ethics can be defined as the discipline dealing with right versus wrong, and the moral obligations and duties of entities (e.g., humans, intelligent robots, etc.).

Ethics has been studied by many researchers from different disciplines. Most humans are familiar with virtue ethics since very young because it is a behavior guide instilled by parents and teachers to help children practice good conduct. Aristotle (Yu, 1998) believes when a person acts in accordance with virtue, this person will do well and be content. Virtue ethics is part of normative ethics, which studies what makes actions right or wrong. It can be viewed as overarching moral principles that help people resolve difficult moral decisions. As the interaction between humans, between humans and animals, between humans and machines, and even between machines is increasing, ethical theories have been applied to real-life situations, such as business ethics, animal ethics, military ethics, bioethics, and machine ethics. The study of ethics and ethical principles is constantly evolving and developing. Table 1 lists several ethics definitions given by researchers.

In the context of AI, the ethics of AI specifies the moral obligations and duties of an AI and its creators. Researchers have done much work studying human ethical issues. Many ethical frameworks can be used to direct human behaviors, such as actions and activities related to respect for individuals,

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<th>Table 1. Definition of ethics</th>
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<td><strong>Normative Ethics</strong></td>
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<td>Ethics is the capacity to think critically about moral values and direct our actions in terms of such values.</td>
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<td>Ethics is a set of concepts and principles that guide us in determining what behavior helps or harms sentient creatures.</td>
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<td>Ethics is the norm for conduct that distinguishes between acceptable and unacceptable behavior. Ethics is the discipline that studies standards of conduct, such as philosophy, theology, law, psychology, or sociology. Ethics is a method, procedure, or perspective for deciding how to act and for analyzing complex problems and issues.</td>
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**Applied Ethics**

Computer ethics is the analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology. Moor, 1985, p. 266

Machine ethics is concerned with giving machines ethical principles or a procedure for discovering a way to resolve the ethical dilemmas they might encounter, enabling them to function in an ethically responsible manner through their own ethical decision making. Anderson and Anderson, 2011, p. 1
An Overview on Signature File Techniques
www.igi-global.com/chapter/overview-signature-file-techniques/20750?camid=4v1a

Performance Comparison of Static vs. Dynamic Two Phase Locking Protocols
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