Short Paper 1: Anticipating Ethical Issues in Emerging IT

Davos DeHoyos

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Texas State University | Professor Edwin Vargas-Garzon, PhD

Introduction

Technological advancements introduce new ethical challenges that require careful anticipation and analysis. In *Anticipating Ethical Issues in Emerging IT*, Philip A. E. Brey presents *anticipatory technology ethics (ATE)*, a method for analyzing ethical dilemmas in emerging technologies at the early stages of development. This paper will analyze Brey's rationale and methodology, contrast his approach with ethical theories from *Ethics for the Information Age* by Michael J. Quinn, and apply these insights to quantum computing as a contemporary example. Finally, this paper will provide policy recommendations based on Brey's framework.

Brey's Rationale and Methodology

Brey's approach to ethical anticipation is grounded in ATE, which seeks to uncover hidden ethical implications of new technologies before they become widespread. His methodology includes the following steps:

1. Identifying emerging technologies that pose potential ethical concerns.
2. Recognizing that technological impacts extend beyond immediate effects, influencing social, political, and economic structures.
3. Using ethical foresight analysis by predicting scenarios, assessing potential risks, and recommending mitigating strategies.

Brey argues that traditional reactive ethics fails to address potential harm adequately, advocating for a proactive approach that integrates ethical assessment into the development process. He outlines three levels of ethical analysis: technology, artifact, and application. At each level, different ethical questions arise, ranging from fundamental concerns about a technology's inherent risks to its real-world applications and unintended consequences.

Quantum Computing as a Contemporary Example

Quantum computing represents a transformative shift in computational power, promising advancements in artificial intelligence, cryptography, and scientific research. However, it also raises ethical concerns, particularly in data privacy and cybersecurity:

- Breaking encryption: Quantum computers can decrypt widely used encryption methods (RSA, ECC), potentially compromising financial transactions, government security, and personal data privacy.
- Data inequality: The technology's accessibility may be limited to well-funded entities, exacerbating digital divides between nations and organizations.
- Algorithmic bias: Quantum-enhanced AI could amplify biases, leading to ethical dilemmas in decision-making systems.

Applying Brey's framework, we can anticipate these risks and explore safeguards before quantum computing becomes mainstream.

Comparing Brey's Approach with Traditional Ethical Theories

Brey's anticipatory ethics aligns with certain ethical theories but diverges from others:

- **Utilitarianism (John Stuart Mill, Quinn's Book)**: Similar to utilitarianism, Brey emphasizes future consequences of technology. However, while utilitarianism seeks the greatest overall benefit, Brey's approach highlights hidden ethical risks that might be overlooked in a purely cost-benefit analysis.
- **Kantianism (Immanuel Kant, Quinn's Book)**: Unlike Kantian ethics, which follows strict moral rules and duties, Brey's framework is contextual and dynamic, adjusting to technological developments. While Kantianism would assess whether developing quantum computing aligns with moral duties, Brey focuses on anticipating practical consequences and mitigating harm.
- **Virtue ethics (Aristotle, Quinn's Book)**: Brey's methodology aligns with virtue ethics in emphasizing responsible technological development, ensuring that researchers and engineers cultivate foresight and moral responsibility.

Brey's approach provides a more flexible and forward-thinking framework compared to traditional ethical theories. While utilitarianism and Kantianism assess morality through established frameworks, ATE allows for adaptability in an ever-changing technological landscape.

Response to Brey's Methodology

Brey's argument for anticipatory ethics is compelling because it acknowledges the complexity and unpredictability of emerging IT. However, a potential weakness in his approach is the difficulty in predicting long-term consequences accurately. For example, the initial fears surrounding AI bias were underestimated, leading to widespread ethical issues in algorithmic decision-making today.

Luciano Floridi (2019) expands on similar concerns, emphasizing that supercomputing and AI require ethical foresight due to their unprecedented scale and influence on decision-making systems. Floridi argues that while traditional ethical frameworks provide some guidance, they often fail to account for rapid technological shifts and the unintended consequences of large-scale computation. His work reinforces Brey's position by demonstrating how past failures to anticipate ethical dilemmas—such as in AI-driven surveillance and automated decision-making—have led to widespread privacy violations and biased outcomes.

Despite this limitation, Brey's framework remains a valuable tool, particularly when applied to high-risk technologies like quantum computing. By integrating the ethical impact assessment strategies outlined by Floridi, ATE can be further strengthened to include continuous monitoring and iterative policy adjustments rather than relying solely on initial predictions.

Implications and Recommendations

Based on Brey's framework and the example of quantum computing, the following policy recommendations emerge:

Policy

- Establish global ethical review boards to assess emerging technologies before widespread implementation.
- Require mandatory risk assessments for companies developing quantum computing applications.
- Develop international cooperation agreements to prevent quantum technology from being exploited by authoritarian governments or monopolized by a few corporations.

Legal Framework

- Introduce regulations ensuring that quantum advancements do not violate existing privacy laws (e.g., GDPR, HIPAA).
- Enforce export controls on quantum technology to prevent unethical use by authoritarian regimes.
- Establish anti-trust regulations to prevent large tech companies from controlling all quantum computing resources, ensuring fair competition and access.

Human Rights and Ethical Behavior

- Develop ethical guidelines for quantum AI decision-making to prevent biases.
- Ensure fair access to quantum computing resources to prevent monopolization by tech giants.
- Advocate for transparency in the development of quantum technology, ensuring that governments and corporations do not use it for mass surveillance or repression of political dissent.

Sustainable Development

- Encourage research into energy-efficient quantum computing to mitigate environmental impact.
- Promote collaboration between governments, academia, and industry to balance innovation with ethical considerations.
- Require tech companies to commit to sustainable development practices when deploying quantum computing infrastructure, ensuring minimal environmental disruption.

Conclusion

Brey’s framework for anticipating ethical issues in emerging IT provides a proactive methodology that is crucial for addressing ethical challenges before they arise. By applying his approach to quantum computing, we identify key risks in data security, inequality, and algorithmic bias. Contrasting Brey’s method with traditional ethical theories highlights its forward-thinking nature but also its reliance on accurate foresight. Given the current global political climate—marked by intensifying technological competition, geopolitical conflicts such as the chip wars, and the rise of authoritarian regimes leveraging advanced technology for control, anticipatory ethics is more relevant than ever. Future policies must integrate Brey’s approach to ensure responsible technological progress that aligns with human rights, legal standards, and sustainability goals.

Works Cited

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