The Ethical Implications of Artificial Intelligence in Software Development

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As a Computer Science major, preparing for a career in software development, I have always been drawn to the ability to create systems and use logic for applications that solve many different real-world problems. Software development is a career field that I have always looked forward to getting to be apart of and I love that it is constantly evolving with new tools, frameworks, and different technologies. Recently there has been a technological boom, and with it, new innovations such as AI that have changed rapidly. Previously resources like GitHub CoPilot debugging systems were the only forms of predictive based systems that operated much like AI. But now we have tools that allow us as developers to work alongside other software based “intelligent” systems.

While this technology has opened the door to a new era of efficiency and creativity, and has allowed for even “the simplest” among us to learn new complex systems. It now presents new ethical and moral challenges involving authorship, accountability, and fairness. AI is transforming how software is created and maintained, and it raises many important questions about what it even means to be a responsible developer in a world where intelligent machines contribute to human authored work. Its important to understand these ethical implications through both a Christian and professional perspective in order to ensure that innovation continues to serve the humanity that created it, rather than replace it, and harm those it was meant to assist.

As we have already seen over the last few years, AI has reshaped nearly every step of software development. You are now able to open ChatGPT and request assistance to finish sections of code, request specific help to create different applications, and automatically predict bugs and syntax errors before you compile anything. They also help to edit user inputs to ensure that data is consistent and that it behaves according to how the developer intends. According to

IBM (2023), AI enhances productivity by automating repetitive tasks and allowing developers to focus on higher-level problem solving. Which as many other industries have done, this removes the “mental load” off of those who are creating, allowing for more expressed creativity and deeper, more expansive idea generation. Predictive analytics tools are now being used to assist in project timelines, not only to predict potential end dates, but also to assist with managing resources better than traditional methods have always done.

Unfortunately, the benefits of AI, regardless of how good it seems to be, comes with ethical concerns that extend far beyond the niceties of efficiency. One of the biggest concerns is authorship and originality. When an AI model creates code, who owns it? If a model is trained on open source code from thousands of developers, it might attempt to reproduce copyrighted material or biased structures that go against a company policy. Another ethical concern is accountability. Who is responsible for this code and is accountable for it when it is wrong, or an accident happens due to it? When AI builds code, it introduces security vulnerability, who bears this responsibility…the developer, the company, or the AI vendor? Additionally, AI tends to build a bias from the datasets that it is trained on. If these datasets reflect human based assumptions, those assumptions can make their way into software applications and affect millions of users. One of the largest concerns involving AI is the idea of job replacement. While AI promises innovation, it raises deep concerns about human roles in fields that are defined by human creativity and logic, and it would be a shame for AI to take over a field that allows such expressions.

To evaluate the concerns regarding AI, I will be using Scott Rae’s Moral Choices framework (2018), which focuses on understanding facts, identifying moral principles, and making reasoned decisions grounded in character and Biblical teaching. As we know, AI is a

software development tool that is created by humans, yet it lacks the fundamental moral reasoning skills that we are born with. It can produce outcomes, both good and bad, but it is largely dependent on the user's bias, and the information input. The main dilemmas involve responsibility for AI outputs, fairness in its training materials, and the honest representation of human work.

From a Christian worldview, we are accountable for the tools that we use and what is entrusted to us. In Genesis 1:28 we are presented with this framework when we are called to "subdue the earth". This is not a call to simply use earth however we want, but it is a call to take care of, nurture, and carry the responsibility of the outcome of the world. This should reflect in our approaches to innovation as well, to steward, not dominate. Micah 6:8 reminds us to "act justly, love mercy, and walk humbly with your God," this is a principle that I believe fits in perfectly with the idea of responsibility in technology. Developers need to ensure that they use AI not as a replacement for moral judgement, but as a tool that can serve others when guided by humility and integrity. The AMC Code of Ethics (2018) reinforces this responsibility by urging professionals to "contribute to society and to human well-being" and "avoid harm." This is a hard topic for an AI model to even consider, especially since it is imperative that it is a tool that serves humans, but retains a level of honesty, transparency, and respect for privacy. Similarly the IEEE Code of Ethics (2020) calls on engineers to "hold paramount the safety, health, and welfare of the public" and to "improve the understanding of technology." I believe that both codes help to acknowledge areas that are incredibly important as technology develops and shows that it must be guided by a human conscience.

Both the Christian worldview and the professional codes of ethics share a surprising amount of common ground, which is a good thing, it ensures that humanity is protected and

cherished as we continue to move through a rapidly developing technological world. Each emphasizes honesty, fairness, and the prevention of harm.

The Christian perspective grounds largely in divine accountability. The belief that moral responsibility comes from being created in God's image and holding the value of human life as an importance to what AI is allowed to be. The ACM and IEEE, although secular, echo this sentiment through a slightly different lens that focuses on professionalism to the public and our legal system. Christian ethics focus on why we cherish these qualities, verses like Matthew 22:37-39 that discuss loving our neighbor, fuels the purpose and value behind our work, and ensure that we aren't designing technology that is harmful to another human being. The ACM and IEEE provide professional structures for decision making. I believe that both belief systems are compatible with one other, complimentary to human values. One provides religious moral support, while the other provides professional ethics that can reach those who are not religious. Together, I believe that they create a really strong foundation for addressing AI, its challenges, and the responsibility we have to steward it correctly.

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