Towards a New Vision of Distributive, Digital Justice in Healthcare

Introduction

Socioeconomic inequity in healthcare is one of the greatest challenges to public health in modern America. Symptoms of this injustice, such as the rising cost of insulin, have captured attention nationwide. No individual should have to ration life-saving medicine due to exorbitant prices. This issue lies at the heart of distributive justice, an ongoing conversation on how society should distribute different assets. While there are many approaches for distributive justice, confronting the systemic healthcare issue in America starts with a robust computational framework, using methods like big data, that can predict healthcare costs for individuals using background information (Bertsimas et al., 2008).

Algorithmic justice is not an elusive goal in reality. There are three premises to this argument: we can attain digital justice, big data is a means to that distributive end, and creators hold moral culpability for their technical negligence. The below exploration will entail a two-pronged discussion on the theoretical and applied nature of justice and a practical analysis of ethical responsibility in the context of algorithmic negligence.

On Justice in Theory

The paradigm of distributive justice has no tangible end, but it can be gradually attained through constant growth. All digital things derive their forms and behaviors from the real world. Consequently, we must first explore foundational concepts of justice in order to understand digital distributive justice. Through a historical lens, human civilization has overcome the challenges of injustice through cataclysmic revolutions both political and intellectual, from the

Enlightenment to the U.S. Civil Rights Movement. Nothing is set in place. People change; ideals shift.

One key distinction is that the nature of justice is not absolutely retributive. In society, we have the tendency to believe that good begets good and evil begets evil. This erroneous approach to justice leads to the deuteronomistic view of blaming the victim. Said theological view posits that the cause of individual suffering is due to sinning or disobeying God. However, in the real world, those who do harmful actions might be left unpunished, while tragedy befalls those who do not deserve it. The Book of Job in the Old Testament, the bedrock of the modern Judeo-Christian paradigm of justice, is a great example of the danger of this false assumption. Job knows he has not sinned, but Eliphaz and his other friends argue he must have sinned or he would not have been horribly deprived of all his fortune and family. Job himself becomes so anguished to the point he dares to question God for the reason behind his suffering. God does not provide an answer when he speaks out of the storm. Instead, He asks rhetorical questions such as, “Where were you when I laid the foundations of the Earth?” (Job 38:4). With this interaction, Job is liberated from the false expectation of divine retributive justice. From a philosophical standpoint, the Bible supports the notion justice cannot be absolutely karmic.

Since religion directs moral standards, I propose a different framework for analyzing justice which is not causal in nature. Instead, justice should be measured through a framework of progress, based on how many people have been helped and alleviated of their troubles instead of who deserves what specific punishment, a contentious issue tangled with the problem of many hands (Nissenbaum, 1996). Justice should be focused more on moving forward instead of stubbornly chasing punishment, effectively making it a less illusive and controversial aim.

On Justice in Practice

In recent times, national attention has been increasingly focused on the way algorithms impact the distribution of vital resources. They can have ethically right usages, such as healing the wage gap, or unjust applications like the oppression of free speech through facial recognition software. Like any tool in practice, the computational capacity of good and evil coexists. But, improving algorithmic justice in practice is certainly possible, and there are already civic organizations advocating for means to that end.

One such outreach group is the Algorithmic Justice League (AJL). Their platform centers around the belief that, "in today's world, AI systems are used to decide who gets hired, the quality of medical treatment we receive, and whether we become a suspect in a police investigation." The AJL goes on to posit, "While these tools show great promise, they can also harm vulnerable and marginalized people…[When unchecked], AI systems can amplify discrimination." (AJL, 2021). Indeed, there are always risks associated with progress. In order to mitigate threats to social equity, companies should spotlight ethicists who can foster discussion on the moral dilemmas of the ever-growing digital sphere.

Under this exploration centered on the justice of distribution rather than recognition of injustice, equal access to necessary resources holds preeminent relevance (Susskind, 2018). Pertaining to Bertismas' case study, healthcare is a basic human right. This belief drives organizations like Doctors without Borders to provide care in ongoing humanitarian crises like those in Yemen. However, in order to create a more just healthcare system, one must understand the system itself. Robust policy decisions to create accessible healthcare can only be possible through extensive data and research on healthcare costs (Bertismas et al., 2008).

From this standpoint, digital justice is making great strides as reflected in academic literature. I would quantify justice, in a healthcare context, based on whether more people can enjoy reasonably-priced medical resources. In Bertismas' study alone, 800,000 insured Americans acted as the input for the algorithmic model which was then able to predict the healthcare costs of 200,000 new individuals with remarkable accuracy (Bertismas et al., 2008). Academics like Bertismas play a vital role in analyzing knowledge necessary to create effective standards of digital justice. Computer scientists increasingly use predictive modeling of big data to study healthcare costs as a first step to finding remedies (Susskind, 2018).

One counterargument to this view of distributive justice is the notion that the existence of justice is a paradox itself. Assuming that hierarchical systems exist in nature and such systems perpetuate injustice, one may argue justice is an impossible ideal. Although humans categorize and hold implicit biases, viewing human nature as stuck in hierarchy is too broad of a framework and a disservice to society's capacity to change. I would measure justice in a uniquely human, flawed sense. Real justice, as pursued in the world, is imperfect but deeply rooted in progress. Healing one more injustice is all that matters; the goal of eradicating the root of evil is irrelevant because it is not substantive. Actions carry more weight than attempting to debate the theoretical nature of ends.

In a broader context, advances in big data have tremendous potential to exceed the limits of human processing power and help us understand our world (Labrinidis & Jagadish, 2012). Furthermore, I would argue algorithmic systems are a strong net positive for humanity. As the delphic maxim "know thyself" suggests, great tragedy stems from our incapacity to understand ourselves. Likewise, worldly catastrophes arise when we cannot understand the workings of the world we inhabit. Big data makes it possible for us to test the boundaries of knowledge, using

unprecedented processing power to find sophisticated patterns in data only capable through computational analysis. Gaining greater knowledge of the modern world with big data can then propel progress for addressing an array of relevant issues like climate change, healthcare accessibility, and urban poverty.

In light of this human framework of progress, justice itself is indeed attainable. As seen with Bertismas' dataset of one million patients, the research of big data is a crucial avenue to digital distributive justice. Such research analyzes complex information, catalyzing the process of fixing healthcare and other issues. With these two premises supported, the next section will proceed with an examination of the subsequent implications on moral responsibility.

On Responsibility

Just like any good scientific experiment, the researcher must create a thorough procedure to ensure precision and accuracy of their work. Any short of that professional, achievable standard would be willful incompetence. In a similar perspective, computer scientists should be held largely responsible for how rigorous their "experimental standards" are in regards to the design of algorithmic systems. Thus, the below section will focus on the nature of moral responsibility, in this case defined by who should bear the social blame for a causal event, as related to mistakes in algorithmic systems.

First, multiple negligent errors have to occur in order to cause a huge systematic accident. Often, it is not a problem with the system, but rather, a series of random human errors. In the infamous accident of Therac, a lethal case of computer-controlled radiation therapy gone wrong, multiple errors occurred. To name a few, there was lackluster communication between hospitals and manufacturers, no hardware to catch bugs, poorly-designed error messages, and no attempt

by the producers to fix commonly recurring issues (Lim, 1998). It is hard to assign moral blame on one actor out of a complex web of parties involved, and in that regard, moral responsibility is difficult to define and measure. However, the developers of the machine should have addressed clearly apparent errors they were capable of correcting. That is the technical baseline of responsibility in this scenario. Extensive safety testing should be required for all high-impact technologies to prevent similar tragedies. Anything short of that would be recklessness, for the developers know very well that lives may be on the line.

Take the example of an innocent child drowning in a lake. If another person walks by, the individual would be morally required to save the drowning human if possible without danger to their own life. If they take no action, then their inaction would be morally blameworthy. Likewise, software developers cannot just create something and leave it alone without checking for fixable bugs. Inaction itself is a determinant of moral responsibility. Ought implies can. The negligent machine creator is partially responsible if said individual could have easily fixed the glaring error, as in the case of Therac. Social recognition, even without punishment, has transformative capability in creating an economy of safer technology, for virtually no one wants their name to be associated with crimes.

In the case of Bertismas' algorithmic model predicting healthcare cost, rigorous testing and documentation was provided to give no doubt about the safety and relative validity of his model. By all means, his paper is the epitome of scientific documentation and due diligence. He takes exceeding care in using specifically defined statistical measures which are less sensitive to outliers and more suitable for analyzing healthcare costs (Bertismas et al., 2008). Then, even if something went wrong, he would not bear moral responsibility because he did his work to a professional standard, the opposite of what occured in Therac.

This approach applies to a particular negligent scenario, only partially addressing the counterposition regarding the impossibility of fairness with the problem of many hands. More discussion is needed in regard to the moral responsibility of large company entities to complete the puzzle. But, at the very least, if a designer does not fix an apparent error they are capable of solving, a decent portion of the burden of moral responsibility should fall upon them. Falling short of the ethical standards exhibited by Bertismas or other algorithmic researchers is negligent. This progress-oriented framework would further ensure digital justice by focusing less on tangible punishment and more on the power of blame recognition.

Conclusion

Distributive justice is complex yet attainable through big data. In society, moral responsibility and the recognition which comes with it is a powerful factor which can ensure potentially fewer algorithmic injustices. Social recognition is a powerful tool to further algorithmic justice in the sense that it would encourage robust standards of error analysis. Thus, strict moral responsibility for technical negligence would further the cause of digital justice. In Bertismas' healthcare study, anything less than extensive statistical analysis would be unacceptable in Academia. This standard should be the same for the realm of Big Tech. In a world where data is oil and modern life is driven by algorithms, digital regulations must be forged with prudence.

Works Cited

"Algorithmic Justice League - Unmasking AI Harms and Biases." Algorithmic Justice League - Unmasking AI Harms and Biases, https://www.ajl.org/.

Bertsimas, Dimitris, et al. "Algorithmic Prediction of Health-Care Costs." *Operations Research*, vol. 56, no. 6, 2008, pp. 1382–1392., https://doi.org/10.1287/opre.1080.0619.

Holy Bible, New International Version®, NIV® Copyright ©1973, 1978, 1984, 2011 by Biblica, Inc.® Used by permission. All rights reserved worldwide.

Labrinidis, Alexandros, and Hosagrahar Jagadish. "Challenges and Opportunities with Big Data." *Proceedings of the VLDB Endowment*, vol. 5, 2012, pp. 2032–2033., https://doi.org/10.14778/2367502.2367572.

Lim, Joanne. "An Engineering Disaster: Therac-25." Oct. 1998, https://tildesites.bowdoin.edu/~allen/courses/cs260/readings/therac.pdf.

Nissenbaum, Helen. "Accountability in a Computerized Society." *Science and Engineering Ethics*, vol. 2, no. 1, 1996, pp. 25–42., https://doi.org/10.1007/bf02639315.

Susskind, Jamie. Future Politics: Living Together in a World Transformed by Tech. Oxford University Press, 2020.