

As part of our Informatics Large Practical university course, we have been asked to develop a prototype for a food delivery system. The system is supposed to deliver lunch orders to students using an autonomous drone confined to the central campus area, such that students won't have to queue and pick up their orders in person. Autonomous drones are, simply put, a type of aircraft without a human pilot, that operates using artificial intelligence. As a relatively new and rapidly developing technology, drones raise some concerns regarding their social impact, as they have the possibility of creating unintentional harm if those who have the power to use them don't do so responsibly.

The first potential cause for unintentional harm comes from people's fear of drones. The lack of information and technical knowledge regarding drones leads people to perceive these as being risky [1][2] because they associate this lack of knowledge with a lack of power and freedom. Common concerns include the possibility that a drone could malfunction and physically harm someone; in regards to deliveries, people are concerned that they might not receive their order due to an unexpected event. Invasion of privacy is also a common fear among the general public [2]. Moreover, as drones become more popular, there is also potential for noise and visual pollution [3]. The introduction of a drone food delivery system doesn't concern just the University of Edinburgh student body – since the drone will fly in a public space, it is important to consider how this affects anyone who might pass through the drone's area of activity. Thus, even those that do not use the system will be inevitably affected by it. This raises the potential for unintentional harm. While the students may be aware of how the system works and how they should interact with it, we can't assume the same for the rest of the population. Not being aware of the university's new system and seeing a drone flying around the city might cause a lot of emotional distress or annoyance to people, by making them feel like they're in physical danger or under surveillance. Additionally, fear towards the drone might lead people to act rashly and cause themselves more harm, for example by colliding with the drone. Thus, the lack of trust [4] [5] and knowledge regarding drones could lead to unintentional harm towards not only the student body but the wider public as well.

Another point to consider regarding drone deliveries is automation, which can be defined as "the creation and application of technologies to produce and deliver goods and services with minimal human intervention" [6]. The developers of drone systems have the power to influence the job market through the technologies they create [7]. Through automation, there is a potential for job displacement which can cause unintentional harm. PwC reports that by mid-2030 about 30% of jobs will be at potential risk of automation, with the majority of affected jobs being in the transport sector [8]. The general public fears that robots and AI will eventually replace them at their jobs, and it seems that this fear is not unfounded [1]. While some sources claim that automation will end up creating more jobs than it is destroying in the long run [9], there is a trend of replacing lower-paying jobs that require more manual labor with higher-paying jobs requiring mental labor, and inevitably, more qualifications or stricter work hours. The promotion of drone delivery systems thus raises the question of how human food delivery drivers will be affected by automation. Automation could greatly improve the quality of services offered, as drones are generally more reliable and cost-efficient than human workers, and are not affected by traffic or road infrastructure [2] [10] [11]. However, because of their flexible hours and low entry requirements, delivery jobs are popular among all age categories, especially with the increase of food delivery demand following the COVID-19 pandemic [12]. Removing delivery jobs could mean increasing the already existing distrust between the general public and the tech community. Thus, the possibility of automation can cause unintentional harm by creating more doubt towards the companies developing such systems and removing highly desirable and accessible jobs.

As the developer for the drone delivery system, I have the responsibility to try and mitigate these harms as much as I can. As a single developer, my power to influence social impact is quite limited, however together with the help of the university and the rest of the student body I believe we can bring forth some positive changes. First, we can educate people on what drones are and how they work, by holding public lectures and demonstrations of how the food delivery system works. This way we can help alleviate some of the worries people might have concerning the lawful operation of drones and decrease distrust towards the AI community. Moreover, we can create more awareness of how big companies use drones in their work, and by spreading this knowledge we can potentially gain enough power as a community to influence the creation of ethical AI and contribute to the ongoing discussion regarding automation. We can also persuade big tech companies that have higher authority in the industry to contribute to educating the general public about the benefit of drones by holding talks and conferences explaining how these work and how they can have a positive social impact.

In conclusion, there are several potential harms the development of the food delivery system could bring, such as making people feel scared or wary towards the impact drones might have on their day-to-day lives. However, there are ways of mitigating them, as long as the developers, the consumers, and the general public work together to challenge unethical behavior and make sure the systems we create are beneficial.

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