Enrollment algorithms are making higher education a hellscape

A new paper shows how they 'contribute to the crises of student loan debt, college dropout, and racial inequities.'

Higher education is facing a series of increasingly dire crises in the United States. Student loan debt is still rocketing ever upwards; student dropout rates are higher than ever; racial inequalities across campuses are dire and often treated as trivial. A new paper published in the Tech Policy Press reveals that algorithms used for boosting revenue via enrollment numbers are making these issues much, much worse.

Enrollment algorithms are created with the goal of building “a better mousetrap,” according to three different vendors interviewed for the paper. These algorithms are not meant to build a better system — they’re created for the express purpose of making a university or college more money. The focus on this numbers game is meant to bolster the university’s coffers, not improve its student body.

“If it is not already clear,” Alex Engler writes, “when industry representatives talk about using enrollment algorithms to build a better mousetrap, the students are the mice.”

FEWER SCHOLARSHIPS, MORE ENROLLMENT — These enrollment algorithms help universities play with a delicate balancing act. Institutions of higher education want to bring in lots of students, but not just any students: They want students that would be willing to accept enrollment while being offered less financial assistance.

That’s where the algorithms come in. They’re built to predict how much a university can low-ball a prospective student while still getting them to enroll. The algorithms work, bringing in exactly the students these institutions need to make hordes of cash. So they keep using them. And it’s students who get left behind in the equation.

STUDENTS GET THE SHORT STRAW — Engler points out the fundamental flaw with this thinking, namely that the amount of funding a student receives doesn’t just affect their intent to enroll — it also affects their likelihood to graduate. One study cited by Engler found that students with just $1,000 in extra unsubsidized loans reduced the likelihood to graduate by over 5 percent.

Right now only 62 percent of full-time college students graduate within six years, and dropouts leave with an average of $14,000 in debt. “Considering the high percentage of college students who drop out with debt they are unable to pay,” Engler writes, “it is a matter of national concern that hundreds of higher education institutions may be optimizing scholarships to entice students to attend, rather than to succeed or graduate.”

As you might expect, these enrollment algorithms are also quite biased. The AI spits out numbers based on what it's fed, which means Black and other minority students are treated differently than white students.

WHERE DO WE GO FROM HERE? — It's unlikely, given their success, that universities will stop using enrollment algorithms. Engler's solution is instead about being more thoughtful in how the algorithms are implemented in admissions systems.

The most pressing change, Engler says, is for colleges and institutions to stop awarding need-based aid and enrollment status based on these algorithms. Those decisions should be made based on merit and financial standing, and final review should all be done by humans.

Engler suggests that colleges and universities would also do well to look at how their funding offers might affect a student's ability to succeed, too. Otherwise the student is destined to be just another number for or against the school's revenue stream — not a living, breathing human working to learn and graduate.

Jack in the Box will try having robots flip burgers

If you still haven't heard of Flippy, chances are you will soon. Miso Robotics' kitchen robot has taken over the French fry stations across much of the White Castle system, and now Jack in the Box JACK -0.1% is testing the technology.

Miso today announced a partnership with the California-based chain to test its Flippy 2 and Sippy products in one of its standalone restaurants in San Diego. Flippy 2 will leverage artificial intelligence, machine learning, computer vision and data analytics to work the fryer, while Sippy will do the same to facilitate the drink station.

Flippy 2 will certainly have its hands full with Jack in the Box's famously robust menu, maneuvering products from curly fries to tacos to chicken nuggets. Meanwhile, Sippy integrates with a restaurant's point-of-sale system to automatically fulfill drink orders at purchase.

Jack in the Box will test the integration of both Flippy 2 and Sippy into its operations and measure the benefits of a connected kitchen, as well as employees freed up for more time in front of customers. If the company likes what it sees, a broader deployment is possible "in the months ahead," according to a press release.

Automating some tactical-level tasks is no doubt desirable as the industry continues to struggle with a significant labor shortage and all-time-high quit rates. Operators expect labor shortages to continue this year and most (including 78% of quick-service operators) plan to leverage automation to help fill those gaps, according to the National Restaurant Association's 2022 State of the Industry report. Two-thirds of restaurant operators say technology and automation will become more common this year.

As such, Flippy has made several headlines, but so have Miso's other products, like Flippy Wings, which is in test at Buffalo Wild Wings, and Chippy, which is in test at Chipotle. In fact, several automation companies have swiftly expanded throughout the industry, from Chowbotics to Serve Robotics to Blendid and Nuro.

For Jack in the Box specifically, CFO CFO +0.6% Tim Mullany said during the company's most recent earnings call that labor shortages pressured Q1 same-store sales performance, as the trend limited operating hours. Those labor pressures have been lingering for a while now and, in November, Mullany expressed confidence about automation as a potential solution.

"We're working on robotics, particularly at the fry station, and we'll have a test underway shortly and we're optimistic about what that has for us in the long term. We're also looking at automated drink machines as far as pulling labor out of the system. These technologies are things that, in our analysis, could be fairly meaningful when we look at the economic model in the long term and across the system," he said.

Jack in the Box has also rolled out new software that enables more effective labor scheduling and other tools aimed at improving restaurant-level economics. During its Q1 call, the company noted it spent approximately $9.4 million on capital expenditures, including for these technology initiatives.

Should this test (and that budget) expand, it will be a major feather in Miso's cap.

"Beginning our journey with a premier brand like Jack in the Box is an enormous step in our commitment to helping restaurants increase throughput, reduce costs and create a safer environment for their staff," Miso CEO Mike Bell said in a statement. "From tacos and curly fries to fountain sodas, the future is now for Jack in the Box, and we are ecstatic to serve as the company's technological arm to assure a quality product gets into its customers hands every time they order."

Miso Robotics was founded in 2016. The company first teamed up with White Castle in July 2020 during the throes of the Covid-19 pandemic. Shortly thereafter, the burger chain expanded the pilot to 10 more restaurants and then, earlier this year, announced Flippy 2's deployment to 100 more of its 350-unit system.

Jack in the Box is much, much bigger, with over 2,200 U.S. locations and a strong tailwind for more. Last quarter, Jack in the Box completed 26 development agreements and signed 98 future restaurant openings, bringing total agreements to 50 and commitments to 201–its highest number of unit commitments in company history.

In a statement, Jack in the Box COO Tony Darden called Miso's technology a "good fit" as the business grows.

Death By Algorithm: The Age Of Killer Robots Is Closer Than You Think

Called "Lethal autonomous weapons" - but "Killer robots" isn't an unreasonable moniker - the proposed weapons would mostly be drones, not humanoid robots, which are still really hard to build and move.

Lethal autonomous weapons don't quite exist yet, but the technology to replace the humans with an algorithm that makes the decision of when to shoot does.

"People who work in the related technologies think it'd be relatively easy to put together a very effective weapon in less than two years."

While today's drones transmit a video feed back to a military base, where a soldier decides whether the drone should fire on the target, with an autonomous weapon the soldier won't make that decision - an algorithm would.

"When people hear 'killer robots,' they think Terminator, they think science fiction, they think of something that's far away," Toby Walsh, a professor of artificial intelligence at the University of New South Wales and an activist against lethal autonomous weapons development, told me.

Why militaries want killer robots Taking the human out of the loop - and designing weapons that fire on their own without human intervention - has terrifying moral implications.

"The most interesting argument for autonomous weapons," Walsh told me, "Is that robots can be more ethical." Humans, after all, sometimes commit war crimes, deliberately targeting innocents or killing people who've surrendered.

"Unlike human soldiers," he points out, "Machines never get angry or seek revenge." And "It isn't hard to imagine future weapons that could outperform humans in distinguishing between a person holding a rifle and one holding a rake."

Emilia Javorsky, the founder of Scientists Against Inhumane Weapons, points out that there's a much better way to use robots to prevent war crimes, if that's really our goal.

So we could design weapons that are programmed to know the laws of war - and accordingly will countermand any order from a human that violates those laws - and that do not have the authority to kill without human oversight.

What could possibly go wrong? Fully autonomous weapons will make it easier and cheaper to kill people - a serious problem all by itself in the wrong hands.

What people are trying to do about it In combating killer robots, researchers point with optimism to a ban on another technology that was rather successful: the prohibition on the use of biological weapons.

Much of the case for biological weapons was that they were unusually cheap weapons of mass destruction - and access to cheap weapons of mass destruction is mostly bad for states.

What exactly makes a system autonomous? If South Korea deploys, on the border of the Demilitarized Zone with North Korea, gun systems that automatically shoot unauthorized persons, that's a lethal autonomous weapon - but it's also a lot like a land mine.

These are autonomous weapons, though they target radar systems, not humans.

What is automated individual decision-making and profiling?

What is profiling?
Profiling analyzes aspects of an individual's personality, behavior, interests and habits to make predictions or decisions about them.

The UK GDPR defines profiling as follows:

'profiling' means any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person, in particular to analyze or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behavior, location or movements.

Organizations obtain personal information about individuals from a variety of different sources. Internet searches, buying habits, lifestyle and behavior data gathered from mobile phones, social networks, video surveillance systems and the Internet of Things are examples of the types of data organizations might collect.

They analyze this information to classify people into different groups or sectors. This analysis identifies correlations between different behaviors and characteristics to create profiles for individuals. This profile will be new personal data about that individual.

Organizations use profiling to:

find something out about individuals' preferences; predict their behavior; and/or make decisions about them. Profiling can use algorithms. An algorithm is a sequence of instructions or set of rules designed to complete a task or solve a problem. Profiling uses algorithms to find correlations between separate datasets. These algorithms can then be used to make a wide range of decisions, for example to predict behavior or to control access to a service. Artificial intelligence (AI) systems and machine learning are increasingly used to create and apply algorithms. There is more information about algorithms, AI and machine-learning in our paper on big data, artificial intelligence, machine learning and data protection.

You are carrying out profiling if you:

collect and analyze personal data on a large scale, using algorithms, AI or machine-learning;
identify associations to build links between different behaviors and attributes;
create profiles that you apply to individuals; or predict individuals' behavior based on their assigned profiles. Although many people think of marketing as being the most common reason for profiling, this is not the only application.

Example

Profiling is used in some medical treatments, by applying machine learning to predict patients' health or the likelihood of a treatment being successful for a particular patient based on certain group characteristics.

Less obvious forms of profiling involve drawing inferences from apparently unrelated aspects of individuals' behavior.

Example

Using social media posts to analyze the personalities of car drivers by using an algorithm to analyze words and phrases which suggest 'safe' and 'unsafe' driving in order to assign a risk level to an individual and set their insurance premium accordingly.

What is automated decision-making?
Automated decision-making is the process of making a decision by automated means without any human involvement. These decisions can be based on factual data, as well as on digitally created profiles or inferred data. Examples of this include: an online decision to award a loan; and an aptitude test used for recruitment which uses pre-programmed algorithms and criteria. Automated decision-making often involves profiling, but it does not have to.

Example

An examination board uses an automated system to mark multiple choice exam answer sheets. The system is pre-programmed with the number of correct answers required to achieve pass and distinction marks. The scores are automatically attributed to the candidates based on the number of correct answers and the results are available online.

This is an automated decision-making process that doesn't involve profiling.

What are the benefits of profiling and automated decision-making?
Profiling and automated decision making can be very useful for organizations and also benefit individuals in many sectors, including healthcare, education, financial services and marketing. They can lead to quicker and more consistent decisions, particularly in cases where a very large volume of data needs to be analyzed and decisions made very quickly.

What are the risks?
Although these techniques can be useful, there are potential risks:

Profiling is often invisible to individuals.
People might not expect their personal information to be used in this way.
People might not understand how the process works or how it can affect them.
The decisions taken may lead to significant adverse effects for some people.

Just because analysis of the data finds a correlation doesn't mean that this is significant. As the process can only make an assumption about someone's behavior or characteristics, there will always be a margin of error and a balancing exercise is needed to weigh up the risks of using the results. The UK GDPR provisions are designed to address these risks.

The Moral Dilemmas of Self-Driving Cars

Results from a new survey reveal cultural differences in whom participants prefer to be spared in fatal accidents.

(Inside Science) -- If your car was in a lethal accident, would you prefer for it to kill one innocent bystander or five? By posing variations of this problem online to volunteers nearly 40 million times, scientists now have insights on how moral preferences regarding such dilemmas vary across the globe, new findings that may help guide how driverless cars act in the future.

Google, Tesla and other major companies aim to make driverless cars a reality, which they suggest could reduce accidents caused by human error. However, fatal accidents that such autonomous vehicles have already experienced -- such as the deadly collision in May of a self-driving Uber car with a pedestrian -- suggest they will not only need to navigate roads, but potentially also the dilemmas posed by accidents with unavoidable deaths. For example, should a driverless car hit a pregnant woman or swerve into a wall and kill its four passengers?

One famous thought experiment that seems perfectly suited to help address this challenge is the so-called trolley problem from British philosopher Philippa Foot. The original scenario had you imagine you were driving a trolley whose brakes had failed, and you had the choice to divert the runaway tram onto either a track where one victim would die or another where five would. The many variations that exist of this problem can help people explore whom they might choose to live or die.

In 2016, scientists launched the Moral Machine, an online survey that asks people variants of the trolley problem to explore moral decision-making regarding autonomous vehicles. The experiment presents volunteers with scenarios involving driverless cars and unavoidable accidents that imperiled various combinations of pedestrians and passengers. The participants had to decide which lives the vehicle would spare or take based on factors such as the gender, age, fitness and even species of the potential victims.

For 18 months, the researchers gathered nearly 40 million such decisions from 233 countries and territories worldwide. They found there were a number of moral preferences shared across the globe, including saving the largest number of lives, prioritizing the young, and valuing humans over animals. Those spared the most often were babies in strollers, children, and pregnant women.

The results also revealed that ethics varied between different cultures. For instance, volunteers from Latin America as well as France and its former and current overseas territories strongly preferred sparing women, the young and the athletically fit. Moreover, in developed countries with strong laws and institutions, jaywalkers were saved less often than people who obeyed traffic laws.

"When we checked to see if results varied by country, we were struck by the variation," said study co-author Iyad Rahwan, a computer scientist at the Massachusetts Institute of Technology in Cambridge.

The scientists also found controversial moral preferences. For example, overweight people were about 20 percent more likely to die than fit people, and homeless people had a roughly 40 percent greater chance of dying than executives, as did people who obeyed traffic signals compared to those who jaywalked.

The scientists cautioned their results might not represent the moral preferences of people in general. For instance, the study's participants were volunteers able to afford Internet access, and were also not selected using careful sampling techniques. "It's an interesting question as to who are the right people to make these kinds of decisions," said computer scientist Vincent Conitzer at Duke University in Durham, North Carolina, who did not participate in this study.

The public can freely explore the Moral Machine results online country by country. The scientists hope their findings will prove useful to governments contemplating regulations on autonomous vehicles and companies programming such machines. "Having said that, the experts don't have to cater to the public's interest, especially when they find these preferences problematic," said study lead author Edmond Awad, a computer scientist at MIT.

Neuroscientist Jana Schaich Borg at Duke University, who did not take part in this research, noted that self-driving car engineers may feel frustrated that they may have to design autonomous vehicles to consider the kinds of rare cases the Moral Machine focused on. Still, "I think it's important to work on these edge cases at the same time as the more mainstream engineering problems," she said. "Society has to trust self-driving cars in order for them to ultimately realize their potential for saving lives, and they won't do that if the cars behave in ways that conflict with their moral values."

The researchers agreed that driverless cars will not often face such life-or-death cases. Still, "they will be constantly making decisions that redistribute risk away from some people and towards others," said study co-author Azim Shariff, a psychologist at the University of British Columbia in Vancouver. "Consider an autonomous car that is deciding where to position itself in a lane -- closer to a truck to its right, or a bicycle lane on its left. If cars were always programmed to be slightly closer to the bicycle lane, they may slightly reduce the likelihood of hitting other cars, while slightly increasing the likelihood of hitting cyclists."

"The precise positioning of the car will appear to cause no ethical dilemmas whatsoever, most of the time," Shariff continued. "But over millions or billions of these situations, either more cyclists will die, or more passengers will die. So similar trade-offs as participants make in the black-and-white scenarios of the Moral Machine experiment emerge at the statistical level -- something we call the statistical trolley problem."

This research may shed light on moral trade-offs that autonomous machines may have to make in other areas. "One example is robot caregivers, who may have to resolve some different moral trade-offs between safety, privacy and autonomy," Awad said.