

Blame the algorithm?

By Sofia Olhede and Patrick J. Wolfe

The year 2020 will stand out for many reasons, not least that of extrema: the worst global pandemic in 100 years, accompanied by racial, economic and societal tensions; worldwide weather events; plagues of locusts in Africa and the Middle East; and, in the technology sector, Apple becoming the first US-listed company to have a \$2 trillion market capitalisation.

Extreme events lead to extreme reactions – a rephrasing, if you will, of Newton’s third law of motion. Notwithstanding the many other events of lasting importance, developments this summer brought algorithms and ethics rapidly to the forefront of public debate. In England, the release of exam results saw demonstrators converge on the Department for Education, chanting “F*** the algorithm!”, aggrieved at the way said algorithm was used to determine students’ final grades in lieu of in-person exams (see page XX).

The British government rapidly reversed course – swapping algorithmic outputs for teacher assessments. But it is clear that the effects of this fiasco will linger. Indeed, the continued use of decision support and risk assessment systems in the public sector is deeply in doubt – at least for the immediate future – with [The Guardian](#) reporting that councils are “quietly scrapping the use of computer algorithms in helping to make decisions on benefit claims and other welfare issues”.

This all brings to mind the Luddite riots of the 19th century, when frustrated workers attempted to halt the mechanisation of production by destroying spinning machines. Yet students and teachers angry at the way an algorithm was used to determine exam grades should not feel offended by the comparison. According to Richard Conniff, writing in the [Smithsonian Magazine](#), Luddites “were neither opposed to technology nor inept at using it”. “Many were highly skilled machine operators in the textile industry”, he says, and they “confined their attacks to manufacturers who used machines in what they called ‘a fraudulent and deceitful manner’ to get around standard labor practices.”

Luddites, according to Conniff, opposed not the technology but the way the technology was used, and the impact this had on workers. Protests against algorithms are, in many respects, similar. The concern is not that algorithms, *per se*, are bad, or that they need to be prevented from making the production of analysis cheaper or more efficient. Rather, the concern is with the way algorithms are, or might be, put to use, and that automatic decision-taking might treat humans simply as objects to be acted upon. Certainly, that is how some students felt about the A-level grade fiasco. One told [Sky News](#): “I feel like I’ve been handed four random letters that have come from nowhere. It’s unjust, it’s completely unfair.”

Algorithms (and other advanced statistical methodologies) can be effective aids to decision-taking in matters of public importance. But to be effective, any tool needs to be well-made and properly designed for the problem at hand. (Clearly, the exam results algorithm was not: its problems were myriad and obvious.) It also needs to be used correctly. Algorithmic decisions must also go hand-in-hand with technical transparency, reproducibility and the need to be able to explain how such decisions are arrived at. We, as a global technical community, risk a severe loss of public trust if we fail to recognise that.

The danger of using technology without explaining its proper context, limitations and caveats is that instead of questioning the context and requiring an appropriate amount of rigor and defensibility, public opinion can take hold against a technology – something the world can ill afford at the moment. As statisticians, we need proactively to champion clear and defensible intellectual frameworks for decision-taking.