Humans are losing the battle against social media algorithms

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Social media has become infrastructural to our society in a very literal sense, argues ***Tero Karppi****. Computer systems are making decisions for us quicker than we can comprehend and a single tweet can knock billions off the stock market. Studying smaller failures and crashes helps us challenge and take control of this situation, hopefully before the next major crash.*

Sometimes a tweet can cost a lot. On Tuesday April 28 the content and media analytics firm Selerity released a tweet about Twitter's earnings before they were public record. Six seconds later, Twitter's shares plunged. According to analysts, high-frequency traders used this information leading to the deep and sudden decline of Twitter's stock price.

Almost two years ago a similar event took place. A hacked Associated Press twitter account sent a message about a terrorist strike in the White House. Within minutes 136bn dollars was wiped out from S&P500 index's value. These crashes show how social media has penetrated all levels of our culture. Furthermore, they show how social media predictions have come to replace knowledge and facts.

In a recent study Kate Crawford from Microsoft Research and I examined the Associated Press flash crash and how social media is being monitored and used by financial markets. We noticed that while social media research and contemporary discussion have been obsessed for the past 10 years with questions related to individual users and their connections – the user like you – we have almost unnoticed entered into an era where other, more powerful actors are also using social media.

Institutional players such as financial markets, security and crisis management, health industry and insurance companies have a particular interest on what is happening on social media. Companies such as Selerity and Dataminr are building software systems that comb through twitter data. These systems use algorithms and Natural Language Processing to analyze the content of tweets. What they are looking for from the data is the future.

Part of the big data hype is that computer-generated data can be used for predictions. Financial markets are predicting stock market fluctuations. Predictive policing software is assisting law enforcement agencies in pre-empting and preventing crimes. Google search data is used to predict the spread of diseases. Life insurers are pioneers in the field of big data and they have been developing personal analytics for more than 100 years to predict when you will die. We are far beyond asking why social media predictions should be used in decision-making. The question we need to ask is how it is used and what are the consequences.

The two twitter flash crashes show that social media predictions orient our interpretations and move our societies in physical ways. Many analysts have claimed that the predictions were made and used by automated computers and financial algorithms. This is a game humans are loosing. Physicist Neil Johnson and a team of researchers noted that human response time is measured in milliseconds while the timescale of financial algorithms is only nanoseconds. Humans cannot respond to these algorithms.

When an infrastructure of computers, which move faster than human response time, begins to act on social media predictions then we are in trouble. The first problem is that predictions based on tweets are not always accurate or even rational. In the case of Selerity the information was correct, but in the case of the Associated Press hack the tweet itself was a malicious hoax. It was designed to cause harm.

The bigger problem is that social media predictions are able to produce these unpredictable consequences. When automated computational systems fight to gain advantage, humans are left to deal with the consequences.

One does not need a computer to predict the potential for flash crashes in all levels of our networked culture. We are giving huge power to these systems. While uncertain predictions in the financial markets cause mainly monetary losses, consider what happens when this same uncertainty is injected into law enforcement or public sector decision-making.

It is however this uncertainty that might also save us. Let's not wait for the major flash crash. Let's look at the smaller failures and crashes in order to see how they determine our situation. Only when we accept that predictions are based on uncertainty and that these systems operate on probabilities can we begin to challenge them.

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