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*Monday, 4 November 2013*



REPORT FUTUROLOGY

# THE PREDICTIVE MATHS OF WAR

*Can supercomputers predict wars, revolutions and even armed robberies? They're getting there, reports Theresa Breuer.*

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SENIOR REPORTER

Fort Meade, Maryland. Home to some of the largest intelligence databases in the world.

**MONDAY, 2 SEPTEMBER 2013**

Kalev Leetaru doesn't know where the next revolution will start. But he really wants to. So the scientist is feeding his super-computer, Nautilus, at the University of Illinois, with news articles. So far, Nautilus has been fed a hundred million articles from worldwide media outlets, collected over the course of thirty years.

Leetaru encodes the news according to geography and tonality, or sentiment, and has thus created a network of around a hundred trillion semantic connections.

In Egypt's case, for example, Leetaru had Nautilus evaluate 52,438 reports – with surprising results. The data showed that in January 2011, just before the revolution, the mood in Egypt worsened significantly. Only in 1991, just before the Gulf War, was it similarly poor. Leetaru's conclusion? The Arab Spring could have been foreseen.

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"It's like a weather forecast," he says. "A 70 per cent chance of rain tomorrow means that it might not rain, but it's probably worth bringing an umbrella, because the conditions for rain are there."

The world is becoming more like Minority Report with each passing day.

According to Leetaru, political upheavals never come out of the blue. They announce themselves by sending "weak signals". These are pieces of information that indicate discontinuities. Weak signals may be the accumulation of similar events, but also the dissemination of new ideas and opinions.

The latter was observed in the case of the Arab Spring. The increased number of people using Facebook and Twitter in Tunisia and Egypt in early 2011 can also be considered a weak signal.

Leetaru not only predicted the revolution in Egypt, he also foresaw events in Tunisia and Libya. Unfortunately, his studies have one big failing: so far, Leetaru has only managed to predict events that have already happened. This has earned him the nickname "Captain Hindsight".

## NOTHING TO LOSE

Leetaru believes we should give super-computers a chance at predicting global conflicts. Why? Because humans are even worse at predicting major world events than computers. The first people defeated in the uprisings of the Arab world weren't dictators, but political scientists all over the world. None of them had seen it coming.

Middle East experts from the CIA and the International Monetary Fund had been calling the Mubarak regime stable just months before the region exploded.

That wasn't exactly the first time experts failed to foresee earth-shattering events. Take the financial crisis in 2009 or the fall of the Soviet Union in 1990 – these dramatic episodes came as a surprise to everyone. Behavioural scientists say this may be because people, even those paid to predict disasters, are hard-wired to believe in the status quo. Our brains consider stability a given and a good thing.

So if human beings are so appalling at predicting the world's future, we really ought to let the computers have a go. "Big data" is the term that might make it possible. It describes the collection and analysis of vast amounts of data that people leave behind on the internet. Twitter, Facebook, Google+ and other social platforms are acting as giant funnels for humanity's fears, concerns and hopes.

## WHO CARES?

Companies operating on an international level hope to profit from big data research. The Arab Spring, for instance, came as a shock to many businesses operating in the region. The political upheavals have shaken up the balance of power, and simultaneously weakened security forces. As a result, crime rates have exploded in many places.

Jihadist groups are spreading. Terrorist attacks in North Africa have become a permanent threat, as well as the risk of being kidnapped as a foreign traveller.

Given these new uncertainties, companies face the question of whether they want to invest in volatile regions or how they can remain operational if they are already there. What these companies need is an early warning system that can reliably detect emerging crises and political turmoil to allow them to plan things like evacuations.

The American software company Recorded Future has developed an approach that might help. The company's method is called "information retrieval". It scans online news publications, blogs, public niche sources, trade publications, government websites, and financial databases. It then analyses the content to identify references to entities and events, and visualises insights to explore the

past, present, and possibly future.

Interest in this technology is huge: Recorded Future has received venture capital investment from both Google and the CIA.

Yet another method to foresee the future is “predictive modelling”. It has been used by police forces in the United States since 2005. Somewhat like the pre-crime program in the movie *Minority Report*, the IBM software “Blue Crush” predicts when and where a crime might be committed.

The idea is that police can wait at the possible crime scene and stop the burglar before he breaks into the jewellery store. Some cities have been able to reduce their crime rates by up to 30 per cent using this software.

Blue Crush and Nautilus are major steps toward a future in which we can rely on the vast storage and processing power that is becoming ever more affordable. People replaced by computers are a mainstay of dystopian science fiction, but in the realms of conflict and crime prediction it could be a welcome development.

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Write to the Editor

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