

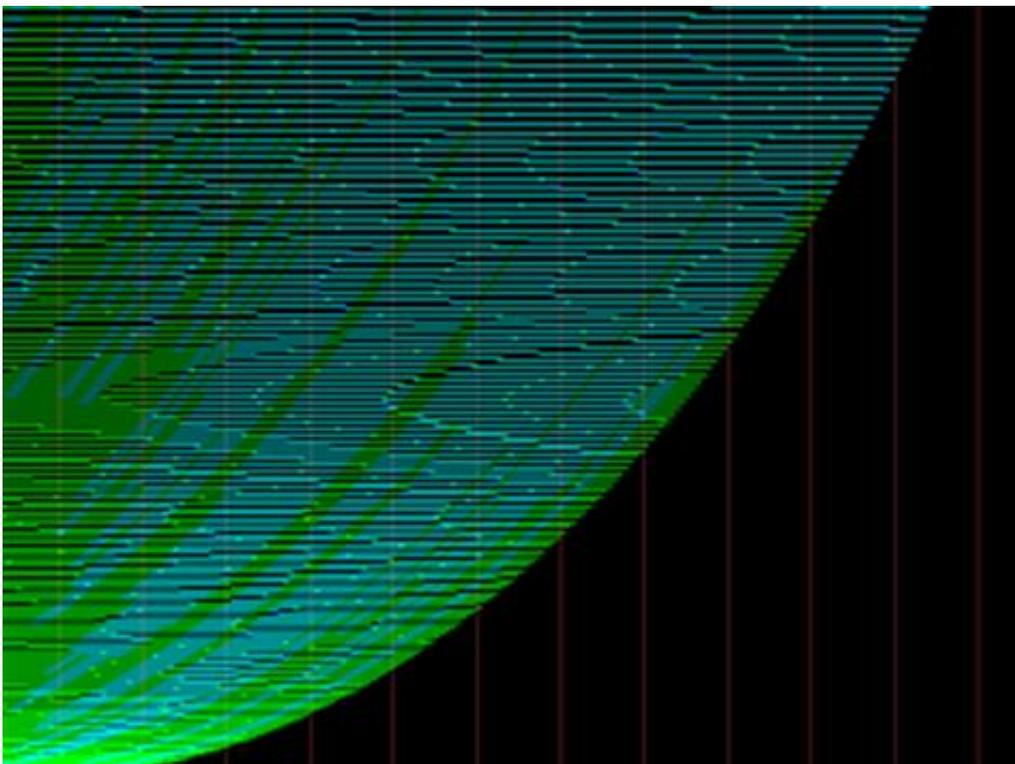


How maths guarantees artistic success - in the long run

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An algorithm developed to handle transport logistics may help artists find a surer path to audience success. The key is social media.



Anyone who creates for an audience knows the business is risky. Success can't be predicted, flops abound, and every launch or opening is a throw of the dice.

But a group of researchers in Australia has published [a paper](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4382093/) (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4382093/>) which suggests that the art market can be predicted, success assured and certainty detected in the chaos.

Under the right conditions, justice will prevail. As lead researcher Pascal Van Hentenryck acknowledged in an interview, his work amounts to a statistical basis for a moral universe.

It also seems to contradict all our intuitions about success and failure in the arts. How can human taste be measured mathematically and predicted? How can calculus reduce the production gamble?

Pascal Van Hentenryck (<http://org.nicta.com.au/people/phentenryck/>), originally from Belgium, was recruited in the United States to lead the optimization research group at NICTA, aka National Information and Communications Technology Australia, a research centre of excellence mostly in Sydney, Melbourne and Canberra. It is intellectually very powerful, housing researchers recruited around the world to build subject groups which are among the top five in their field. Van Hentenryck's own team has 70 people working in areas like disaster management, supply chains and visualisation.

So this is a group which is deadly serious. Really, they are trying to create predictable outcomes in complex systems, so they can plug values into large computer programs and predict the future. To them, the problem of certainty in the arts is an intriguing example of the interface between statistics and human behaviour.

'What I find very nice about this research is that you are mixing social sciences and computational thinking, using the social aspects of the way people behave and trying to use algorithms to take that into account,' he said.

His basic tool is the Simplex Algorithm, invented in 1947 by George Dantzig to handle transport logistics in the United States Air Force. It is the most widely used algorithm in the discipline and it enables researchers to predict outcomes over time as they race upwards and become exponential.

The trigger for his research is a depressing set of US experiments (http://www.princeton.edu/~mjs3/salganik_dodds_watts06_full.pdf) released in 2006 which suggested that the cultural market is inherently chaotic and unpredictable. For investors and agencies, this is a terrible state of affairs. [The lead researcher, Duncan Watts (http://en.wikipedia.org/wiki/Duncan_J._Watts), is an Australian working for Microsoft].

But Van Hentenryck and his team realised that these experiments never allowed the entire market to play out over its full life cycle. They did not recognise that the system could stabilise and become predictable.

What is the magic feature of the system which enables this to happen? Social media.

This is how it works. Begin with a good piece of work. It can be anything from a song to a play, or a film or even a fashion item. Hold onto to that idea of good, because it is crucial.

The work is put into the marketplace, and begins to get traction from word of mouth and social media, to get what he calls 'social attention'. At this point the situation is pretty random - the local critics, for instance, can be very nasty about

a play. But, over time, the approval shows through and audiences get positive signals. They are talking to each other, amplifying their approval, sharing and discussing.

To the scientists, they are creating a feedback loop. Their approval makes the presence in the marketplace stronger.

At this point, we can deploy 'social incidence.' We inherently want to buy or attend the best, and the messages in our social world accumulate to recommend the star experiences. In terms of the algorithm, that is the point where the work starts to become exponential. We want to buy the best and the best has been selected through retweets, Facebook likes or YouTube views.

On top of the general social media traffic, ranking sites with their own algorithms ensure success begets success. Rotten Tomatoes, Amazon, Netflix and, of course, the Google search process suggest and recommend, thereby setting the agenda for consumption.

Of course the theory does not always translate to the marketplace. Musicals go dark, films like *Babadook* have disappointing business, independent filmmakers say constantly. 'I had very little marketing, I was up against a blockbuster on the first weekend, and I was cut out of the most lucrative evening sessions and on a spiral to nothing.'

In the real world, beyond this academic fascination, it seems there is no justice.

But Pascal Van Hentenryck argues justice is out there. The fact that an individual artist has not been touched by the fairness fairy does not mean it does not exist. The key factor, he says, is time.

Certainty, in Van Hentenryck's definition, means that the best always comes to the top. Because of the power of social attention, backed up by the new tool of social incidence, you can beat the overwhelming power of cashed-up marketing budgets and heavy television advertising - provided you have the time to be patient.

What is more, the system is inherently resistant to being gamed. While professional marketers can pump out fake Twitters, for instance, they are eventually overwhelmed by the real impression of the audience. In a way, the research demonstrates mathematically that lying doesn't work.

'You can lie to some of the people some of the time, but you can't lie to all of the people all the time. At some point you will be found out and the right products are going to emerge - if you have enough time,' he said.

What about that question of a good piece of work? The idea that quality is a constant you can plug into an algorithm sounds pretty unlikely because it is inherently subjective.

Image: Visualised algorithm via [Bruce Perry](http://blog.brucemerry.org.za/2010/09/visualising-sorting-algorithms.html)
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We are dangerously close to circular reasoning here, where we say that a work is good because a lot of people saw it, and a lot of people saw it because it was good. Fortunately this trap is an occupational hazard in this intellectual territory.

In a broad, mainstream sense, we are talking about works like major plays or films or television series which people do generally agree are good. There is a rough consensus. Here the theory asserts that a widely honoured work will get its just deserts over time, if it properly supported by social attention and social incidence. That means *The King's Speech* will come through, and *Prometheus* will be identified as a stinker.

However, it also works for minority projects with small audiences competing for time in theatres or galleries, cinemas or the television schedule. With the right support, the audience will find it and justice will be done. Here we can see the importance of understanding and identifying the right audience, which has become a key strategy in evolving Australian cinema.

Ultimately, though, Van Hentenryck argues that bad will fail. If it is aggressively promoted and is rejected, it is a bad work. There are many failures in the cultural marketplace and they are either not given enough time, or they are bad according to criteria applied by the particular audience. Hence a film like *Kenny* can do well here, and fail in the United States. We recognise the humour and the Americans don't, so it just wasn't funny.

Besides arguing that our faith in social media is justified by science, the research team has also pushed that concept of social incidence into the limelight. That is very important because it is a half-constructed tool. We need authoritative ranking systems that provide data about the attractiveness of a project for an audience.

Central to this is the role of the critic. We are constantly faced with examples of projects beloved by critics which fail in the marketplace. *Babadook*, the psychological horror film which did much better in France than its native Australia, is a classic example.

Again, this is about time. But it also emphasises the need for critics with consistent values, whose comparative rankings make sense. It is not about liking or not liking, it is about constructing a grid of judgement which is recognised by the audience and can be amplified.

The NICTA team is very confident of its ability to predict outcomes in the real world, using no more than the algorithm. But the next step is a set of experiments with volunteers with actual taste and all the contrariness of a human being looking for pleasure. That will be very interesting and much easier to understand.

Unfortunately, the work does not address the most basic problem in our search for a stable market with minimal risks. How do we decide if a work is going to be good, before it is made? How to stop the train wreck before anyone buys a

ticket. We are capable of such self-delusion - and an algorithm for that would be truly challenging.

ABOUT THE AUTHOR

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