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Prediction

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Prediction

December 09, 2019

Future tense

Humans have always been obsessed with predicting the future. By knowing what's coming next, we're better able to plan our actions, whether that's saving more grain for a harsh winter, or knowing it's a good idea to invest in a commodity because the price will go up in the future. The correct prediction guarantees success—or survival.

There's just one problem: We're terrible at predicting the future. Blame psychology, evolution, or the complexity of the data, but the truth is that we mostly get in our own way.

Is it possible to get better at prediction? Or, could we create systems to do it for us? Think you know what's coming next?

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BY THE DIGITS

90%: Accuracy with which meteorologists can predict a five-day forecast

50%: Accuracy with which meteorologists can predict a 10-day forecast

15%: Share of events that experts predicted would "never" occur that actually did, according to one study

25%: Share of events they said would definitely happen that did not, according to the same study

10: Seconds between when a person's brain makes a decision (based on MRI readings) and when they consciously realize it

30%: Rate by which a team of "superforecasters" working with the Good Judgement Project out-predicts CIA analysts

$12: Price of a Magic 8 ball, a fortune telling toy

$150 billion: Estimated amount that Americans spend on illegal sports betting each year

Giphy

EXPLAIN IT LIKE I'M 5!

Our biases, ourselves

Thomas Edison's inventions practically defined the 20th century, but he wasn't quite a seer. In 1911, he predicted that the homes of the future would be replete with durable, affordable steel furniture, upon which we would read books made of nickel. Look around—if you're like the typical dweller, the furniture around you today is probably 60% wood.

The biggest reason we're not good at seeing into the great beyond is that our brains are fixed on the near future. Our psychological biases might work for prioritizing what's important to keep us alive, but they don't make us particularly well-suited to imagine anything beyond that. We're overly optimistic that the things we want to happen will actually happen. We erroneously base our predictions on our past experiences. When we get new information, we often think it fits into what we already believe to be true. We notice immediate things but not when they happen gradually, especially over the course of generations. We think bad things will happen, but not to us—in fact, we don't care about them much if they won't.

We're also very bad at synthesizing large amounts of data. Consider the ways we predict the weather. According to Slate, in order to determine if your town will receive snowfall (and how much), meteorologists have to take into account the temperature on the ground, the temperature in the atmosphere, the "snow liquid ratio" (how much liquid, when combined with air, will produce what quantity of snow), and how the movements of high- and low-pressure systems will combine with other atmospheric forces like the lake effect. Almost makes you sympathize with your weather app.

If you're frustrated by these biases, you can partially blame evolution. "Most of the time, our estimates are accurate enough to keep us alive and propagating the species," says Susan Weinschenk, the chief behavioral scientist at the Team W, a consulting and training company. "If you were doing a lot of higher-level computation, you would need more brain power," she adds. Our predictive skills may not be our greatest assets as humans, but they're at least adequate. "Good enough is good enough," Weinschenk says.

QUOTABLE

"It is difficult to make predictions, especially about the future."

—*Danish proverb*

giphy

POP QUIZ

Which of the following have people NOT used to try to predict or affect the future?

Holes in cheese

The shape of animal poop

Bird behavior

The entrails of sacrificed animals

If your inbox doesn't support this quiz, find the solution at bottom of email.

THE WORLD IN 50 YEARS

Looking ahead to 2070

Who will run the world? What will we eat? We asked 46 experts for

their best predictions on the world in 2070. Read more about what our future has in store for us on The World in 50 Years.

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TIME WILL TELL
Can we learn to make better predictions?

Researchers at the University of Pennsylvania have spent a lot of time analyzing what makes someone good at making predictions. These people, called "super-forecasters," are able to make exceptionally good guesses, sometimes by making quick estimates of probabilities in their heads. One way to help people get better at predictions, researchers say, is to give them feedback about which predictions ended up being true and which didn't.

But there's a more effective way to predict the future than improving individual predictors: getting input from lots of people. "The wisdom of crowds is a very important part of this project, and it's an important driver of accuracy," Philip Tetlock, one of the researchers who studies prediction, told NPR. One of the key takeaways from his work is that a diverse group of people drawing on different sources of information will make better predictions than a single, highly trained person, or even a small group of specialists.

BRIEF HISTORY

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4,000 BC: People divine the future via astrology, numerology, palm reading, and tea leaves in Egypt, China, Chaldea, and Babylonia.

1555: French apothecary and astrologer Nostradamus publishes *Les Prophéties*, a book of quatrain predictions, which some say have been eerily prescient.

1660: British chemist Robert Boyle predicts that organ transplants could save lives.

1763: "An Essay Towards Solving a Problem in the Doctrine of Chances" by Thomas Bayes is published posthumously, opening up the field of Bayesian probability.

1792: Robert B. Thomas publishes the first edition of The Old Farmer's Almanac. He uses a secret formula to predict the weather and other astrological events for the year ahead.

1851: Britain's Great Exhibition of the Works of Industry of All Nations is held in Hyde Park, London, kicking off the golden age of fairs.

1865: Jules Verne publishes the first depiction of a moon landing in *From the Earth to the Moon*.

1906: British statistician Francis Galton discovers the accuracy of a crowd-sourced prediction by having the public guess the weight of a dead ox. Most individual guesses were bad, but when averaged out, the crowd was just one pound off.

1909: In a New York Times article, inventor Nikola Tesla predicts the development of wifi.

1917: Alexander Graham Bell, the inventor of the telephone, gives a speech at the McKinley Manual Training School in which he predicts devices that function a lot like cell phones do today.

1918: An article in Scientific American predicts the car of the future, which, among other features will have "no such thing as a driver's seat."

1949: George Orwell publishes the dystopian classic *1984*.

1954: Philip K. Dick's short story "The Minority Report," which

envisions a "Precrime" department that predicts future crimes, is published.

REUTERS/Manuel Silvestri

MILLION-DOLLAR QUESTION
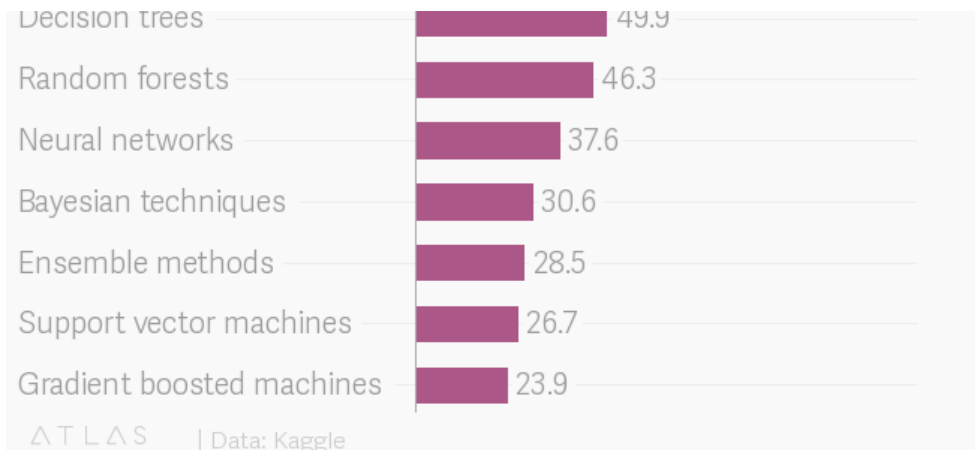
Is the "hundred-year storm" over?

One of the most important predictive concepts is the idea of a "hundred-year storm" or a "hundred-year flood"—a catastrophe that, on average, would not be expected to occur more than once every hundred years. In the United States, many decisions about what to build and insure are made on such predictions. But as Maggie Koerth explains in a detailed FiveThirtyEight piece, much of the data used to make them is spotty or based on conditions that no longer apply. To make matters worse, climate change could make what we think of as a "hundred-year flood" more like a fifteen-year flood.

CHARTED

Most popular prediction methods used by data scientists

(Based on a survey of Kaggle users)

Logistic regression — 63.5%

Decision trees	49.9
Random forests	46.3
Neural networks	37.6
Bayesian techniques	30.6
Ensemble methods	28.5
Support vector machines	26.7
Gradient boosted machines	23.9

△T△LS | Data: Kaggle

THE WAY WE 🔮 NOW

Computing the future

Unlike humans, computers are able to synthesize large amounts of data, which comes in handy for predicting outcomes in complex systems. Right now, prediction-oriented algorithms are pretty limited—they can only predict the next few seconds of video, or how long a hurricane could last. Getting better at predicting certain outcomes has so much potential—for everything from public health to politics—that data science keeps working at it.

"In an age when data are plentiful and computing power is mighty and cheap, data scientists increasingly take information on people, companies, and markets—whether given willingly or harvested surreptitiously—and use it to guess the future," writes Quartz reporter Dan Kopf. "Algorithms predict what movie we might want to watch next, which stocks will increase in value, and which advertisement we're most likely to respond to on social media."

TAKE ME DOWN THIS 🐰 HOLE!

How did the crystal ball come to be associated with predicting the future? This Vice article doesn't offer a singular answer (since there doesn't seem to be one), but gives a fascinating brief history.

Giphy

POLL

Are you better than average at predicting the future?

Yes, I'm sure of it.

Not really.

I probably just think I am.

💬 **LET'S TALK!**

In Friday's poll about Amelia Earhart, **39%** of you said want to know who was really responsible for the assassination of JFK, **37%** were most curious about what happened to Malaysia Airlines flight 370, **14%** said you want to know what happened to Amelia Earhart, and **10%** said you're dying to know the identity of Jack the Ripper.

🤔 What did you think of today's email?

💡 What should we obsess over next?

🎲 Show me a random Obsession

Today's email was written by Alexandra Ossola, edited by Annaliese Griffin, and produced by Tori Smith.

United States

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Theory of mind

| A think piece

Predic...

| The unscientific way to figure out what's coming next

Amelia Ear...

| Commercial aviation's biggest booster

Krampus

| You better watch out

Waterproof ... | The never-ending struggle to stay dry

Six Sigma | 3.4 in a million

Polling | The long, flawed history of predicting votes

Contrails | Curious streaks in the sky

Movie theater p... | Making concessions

Lo-fi beats | Interior design for your mind
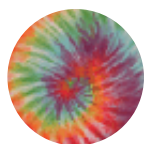
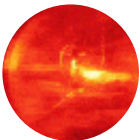# Tie-dye | A sign of the times

Tarot | Finding ourselves in the cards

Shipbreak... | The dirty underbelly of global trade

Black turtlene... | We've got this covered

African fintech | Banking a continent

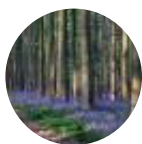## Sirens | Have they become aurally invisible?

Crystals | The new blood diamonds?

White noise | The booming business of quiet

Bananas | Slip sliding away

Green burial | Entering the afterlife al fresco

Bubble baths | Sinking into the suds

5G | The next information superhighway

The Great Briti... | Redefining reality TV, bake by bake
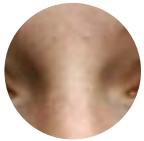
Crossword puzzl... | Getting boxed in

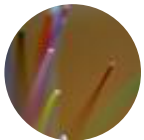**Swiss Army kni...** | Sharper than ever

Watchmen | When comics grew up

Secret passages | The sneakiest luxury

Contact lenses | An optical conclusion

Fiber op... | The data solution with infrastructure problems

Circadian r... | The internal clock at odds with modern life
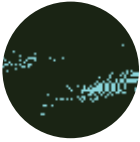
Pinball | Full-tilt entertainment

Glass cliff | Opportunity or liability?

Rubber ducks | We're awfully fond of you

Data compre... | Fitting the internet into the tubes

Black holes | Are the answers within?

Space suits | Earth's highest fashion

Vaping | A foggy outlook on 21st century smoking