Prediction & Uncertainty

Aleksandra & Jannie

Who thinks, that:

- Tarot card readings are absurd and false?
- Science can provide concrete answers?
- We should strive to unlimit uncertainty?
- We can draw regularities from uncertainty?

[for us only]

Contents:

1.History of the algorithm
2.Science: the quest for collective averages
    Social Physics
        Bias
        History
        Flawed input data
        Who is the reader & who is being read?
    Problems with machines, algorithms and big data: prediction errors, arbitrary correlations,...)
    Example: weird future predictions (https://tylervigen.com/spurious-correlations)

3.Big Data (current trends): individual future predictions)
    Move from big picture to individuals (is that where we are making the mistake?
    Shaping & constructing purchasing futures (Surveillance Capitalism)
    Minority Report
        PROMPT: If we can predict the future, can we change it?
    Parallels with divinity (Elena's talk / the oracle of Delphi vs Google)
        PROMPT: Should we always try to know everything & limit uncertainty?
        PROMPT: Is there value in uncertainty?
        PROMPT: How can you draw regularities from uncertainty?

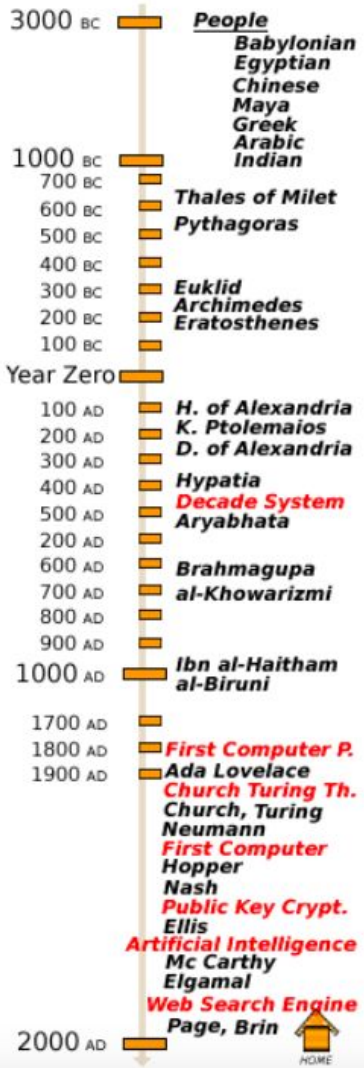
“The more we know the past, the more we can expect the future to be unpredictable.”

- Elena Esposito

First things first...

First things first...

Where does the algorithm come from?



History of Algorithms

Nowadays every person uses the word “Algorithm” as a matter of course, but for the most the exact definition is a mystery. The intention of this site is to get into the secrets of this mystery and become acquainted with the culprits of this nomenclature. The focus is not on the state of the art implementation of specific algorithms but on interesting stories and the involved individuals.

Beside the history of the name we will point out the methodological aspects of algorithmic work and the different programming techniques. In our investigation we will try to summarize and to give an impression of the historical dimension of algorithms. The Babylonian–Sumer–Method of extracting a root, one of the first documented examples of mathematical algorithms, and names like “Euklid” or “al–Khwarizmi” will not be secrets any more.

Algorithms have a long history and the word can be traced back to the 9th century. At this time the Persian scientist, astronomer and mathematician Abdullah Muhammad bin Musa al–Khwarizmi, often cited as “The father of Algebra”, was indirect responsible for the creation of the term “Algorithm”. In the 12th century one of his books was translated into Latin, where his name was rendered in Latin as “Algorithmi”. But this was not the beginning of algorithms. Be curious about more…

Perspective

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Alan Mathison Turing

Born: 23. June 1912 in London
Died: 7. June 1954 in Wilmslow

Turing was conceived in 1911 in Chatrapur, India. His father, **Julius Mathison Turing**, was a member of the Indian civil service. Julius and wife Ethel (née Stoney) wanted Alan to be brought up in Britain, so they returned to Paddington, London. His father's civil service commission was still active, and during Turing's childhood years his parents travelled between Guildford, England and India, leaving their two sons to stay with friends in England, rather than risk their health in the British colony. Very early in life, Turing showed signs of the genius he was to display more prominently later. He is said to have taught himself to read in three weeks, and to have shown an early affinity for numbers and puzzles.

His parents enrolled him at St. Michael's, a day school, at six years of age. The headmistress recognized his genius early on, as did many of his subsequent educators. In 1926, at the age of 14, he went on to the Sherborne boarding school in Dorset. His first day of term coincided with a general strike in England, and so determined was he to attend his first day that he rode his bike unaccompanied over sixty miles from Southampton to school, stopping overnight at an inn — a feat reported in the local press.

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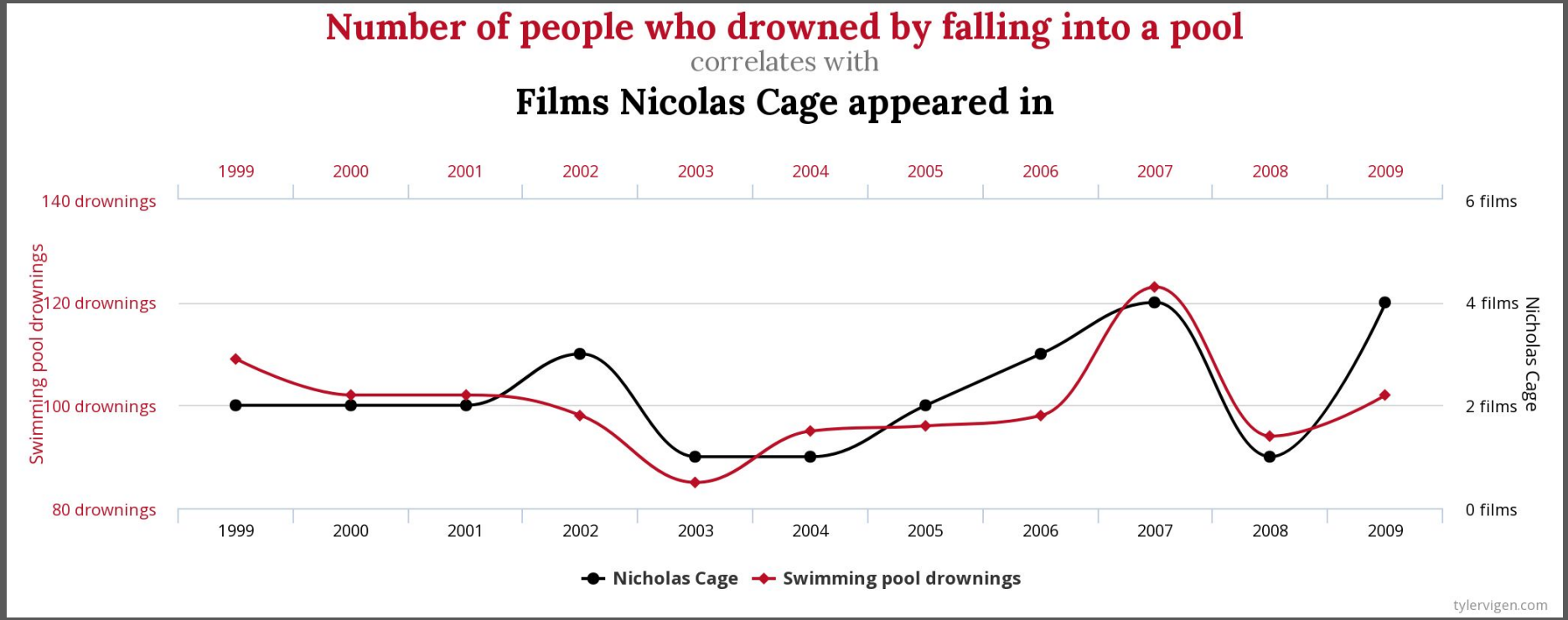
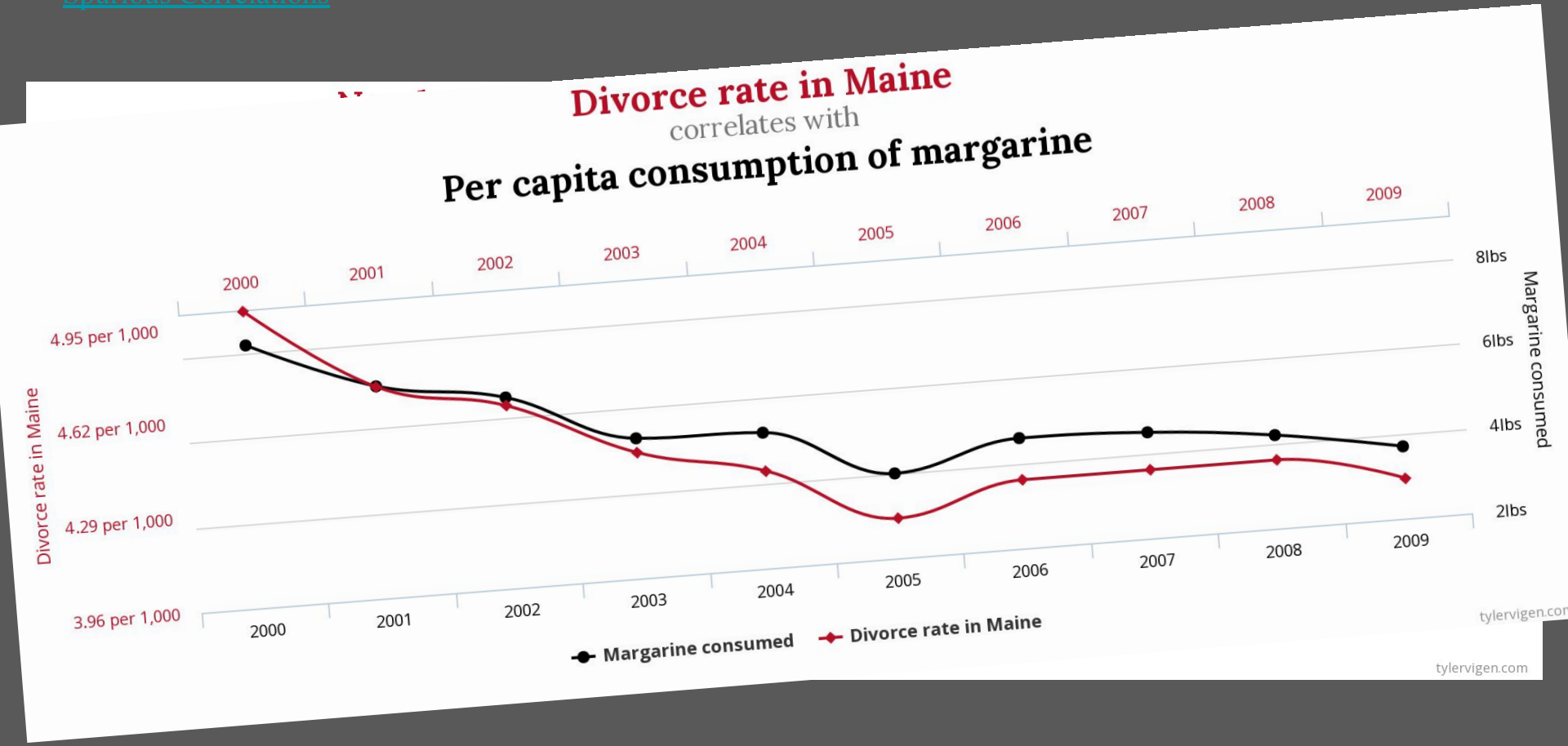
In traditional science, we are used to looking for averages and big picture stuff

...which does not always result in the most useful predictions

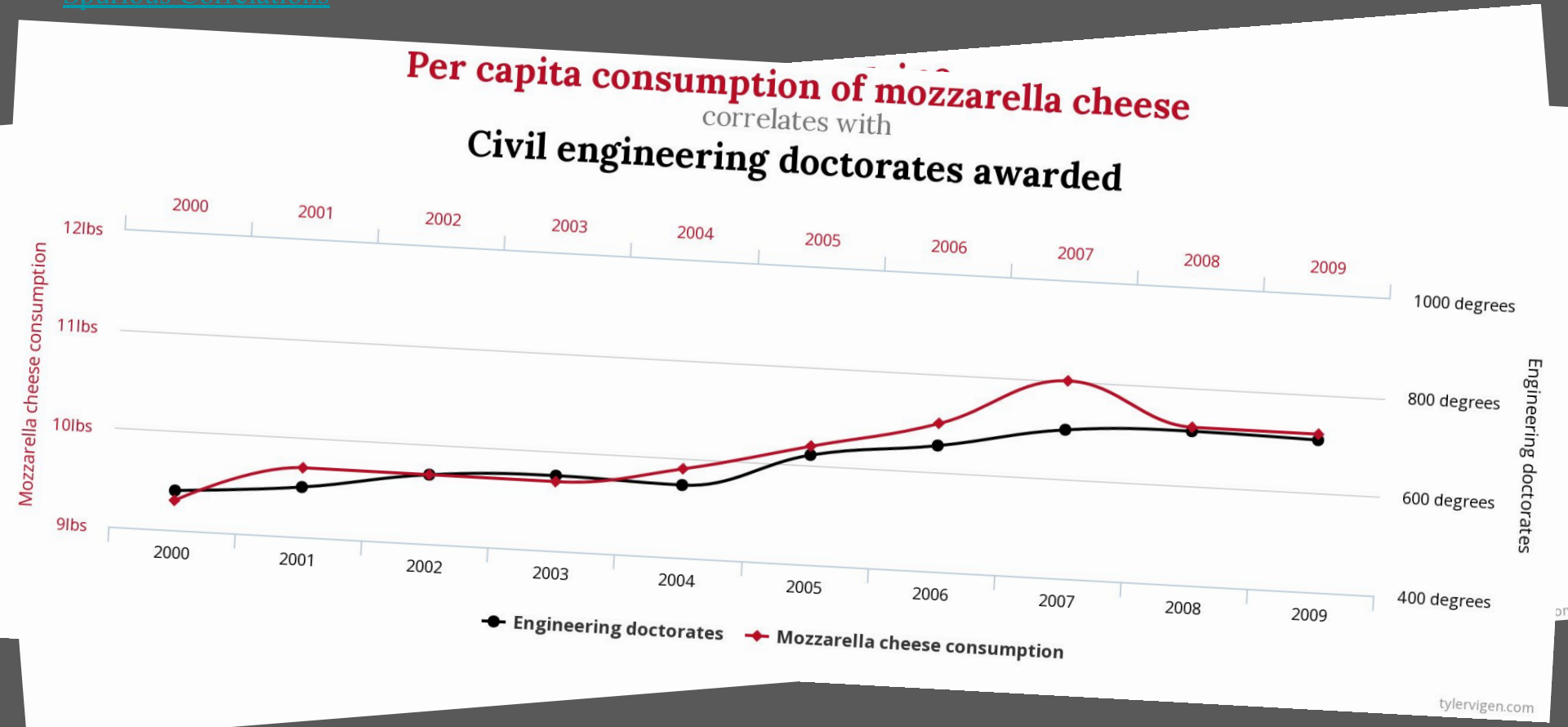
Spurious Correlations



[Spurious Correlations]

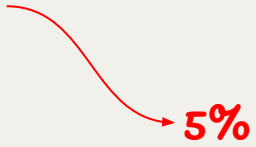


Spurious Correlations



In traditional science, we are used to looking for averages and big picture stuff

p-value statistical significance correlations



Should we always try to know everything & limit uncertainty?

So let’s move onto predicting the world around us to predicting our own behavior...

big picture  **individualized predictions**

Social Physics

Adolphe Quetelet

Belgian mathematician

mid 19th century

[def.] “the idea that human lives have an underlying mechanistic trajectory”

...which leads us to

Big Data Prediction

flawed input data | history of the algorithm | human bias > machine bias | uncertainty & its threshold | prediction errors | arbitrary correlations | surveillance capitalism | constructing future

Minority Report

Minority Report

If we can predict the future, can we change it?

Do we know how the algorithms that make predictions for us work?

we have no idea what happens in the machine, but we take the results it gives us as a definite prediction about the future

Oracle of Delphi

“Know thyself”

Google

“Our mission is to organize the world’s information and make it universally accessible and useful.”

Is there any value in uncertainty?

How can you draw regularities from uncertainty?