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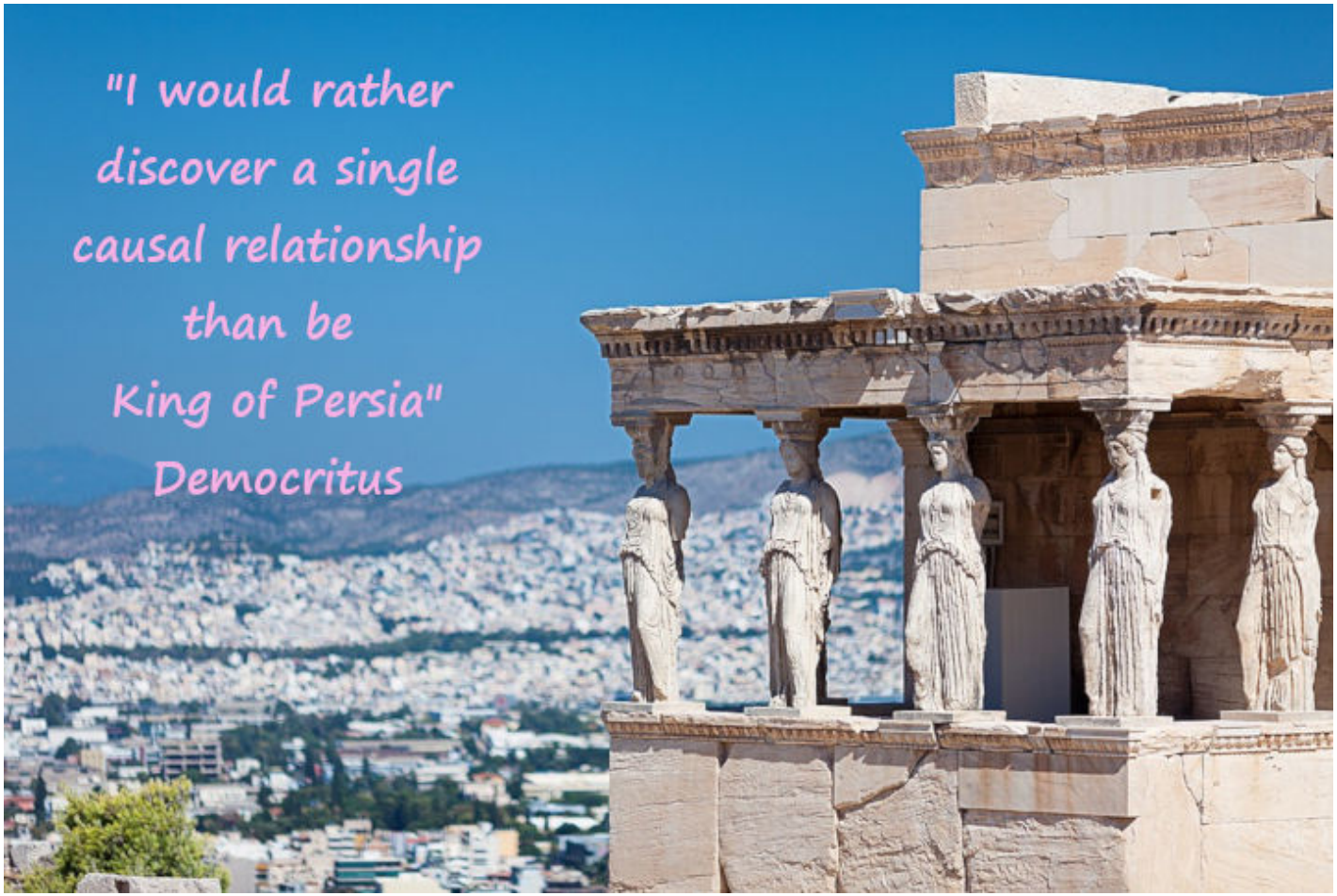
Past: Distinguishing between correlation and causation



Distinguishing between correlation and causation is necessary in all the sciences. It is the goal of science and of the scientific method.

Present: Video by Bob Modesta

In this short 9 min video, a very convincing university lecturer named Bob Moesta relates his highly successful personal experiences applying Causal Inference principles to selling real estate. It made me think of Zillow. Zillow had a fairly large AI team doing non-causal AI, and the results were catastrophic. (NOTA BENE: Bob Moesta does not work for our company.)

Present: Clayton Christensen on Causality

Clayton Christensen was a renowned American academic and business consultant who invented and developed the theory of disruptive innovation. He influenced many famous business leaders and entrepreneurs.

"Correlation does not reveal the one thing that matters most in innovation—**the causality behind why I might purchase a particular solution.** [...]
I spent my life developing theories about management. **A theory is a statement of causality.** Every time you as a manager take an action, it's predicated on a theory: If I do this, this will be the result. If we do it this way, we'll be successful."

— Clayton Christensen

Source: https://hbswk.hbs.edu/item/clay-christensen-the-theory-of-jobs-to-be-done

Future: Spock-GPT

What problems does ar-tiste.xyz solve?

We specialize in Bayesian Networks, Causal Inference and Causal AI

- AI: adding to LLM the capability to do Causal Inference
- Healthcare and Biotech: finding causal pathways for diseases from symptoms or from genome (Causal Genomics)
- Commerce: A/B testing, Uplift Marketing, finding causes of sales
- Weather (Flood and Drought Anticipatory Action)
- Longevity research
- Dieting
- ...

Other startups doing what we do

Mappa Mundi (MM)

We have written open source software called Mappa Mundi (MM) that seamlessly combines 2 giant topics in Artificial Intelligence (AI):

- Large Language Models (LLM) such as ChatGPT, Grok, etc
- Causal Inference (the gold standard theory for distinguishing between correlation and causation. Invented by Judea Pearl)

MM: LLM add-ons

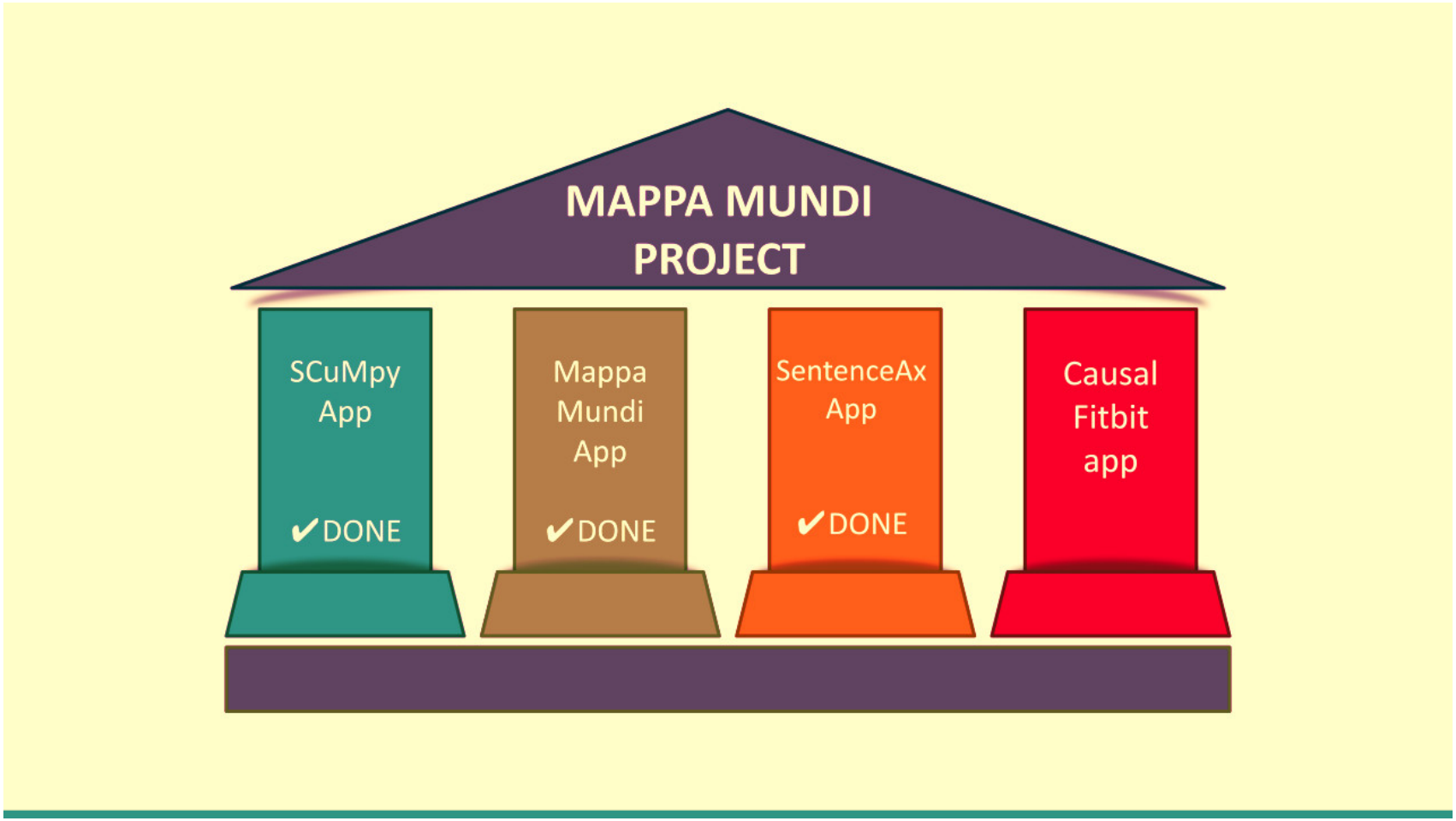
LLMs are currently used merely as exquisite curve fitters. To attain human level intelligence, one needs more than just curve fitters. One also needs to add to LLMs, at the very least, 3 things:

1. a method for discovering causal world models (i.e. DAGs) from data
2. a directory (i.e., atlas) of DAGs. A DAG atlas is necessary so as to remember past DAGs for future reuse.
3. an explicit engine (like our software SCuMpy) for performing Pearl's 3 rungs of causal inference and the closely related scientific method

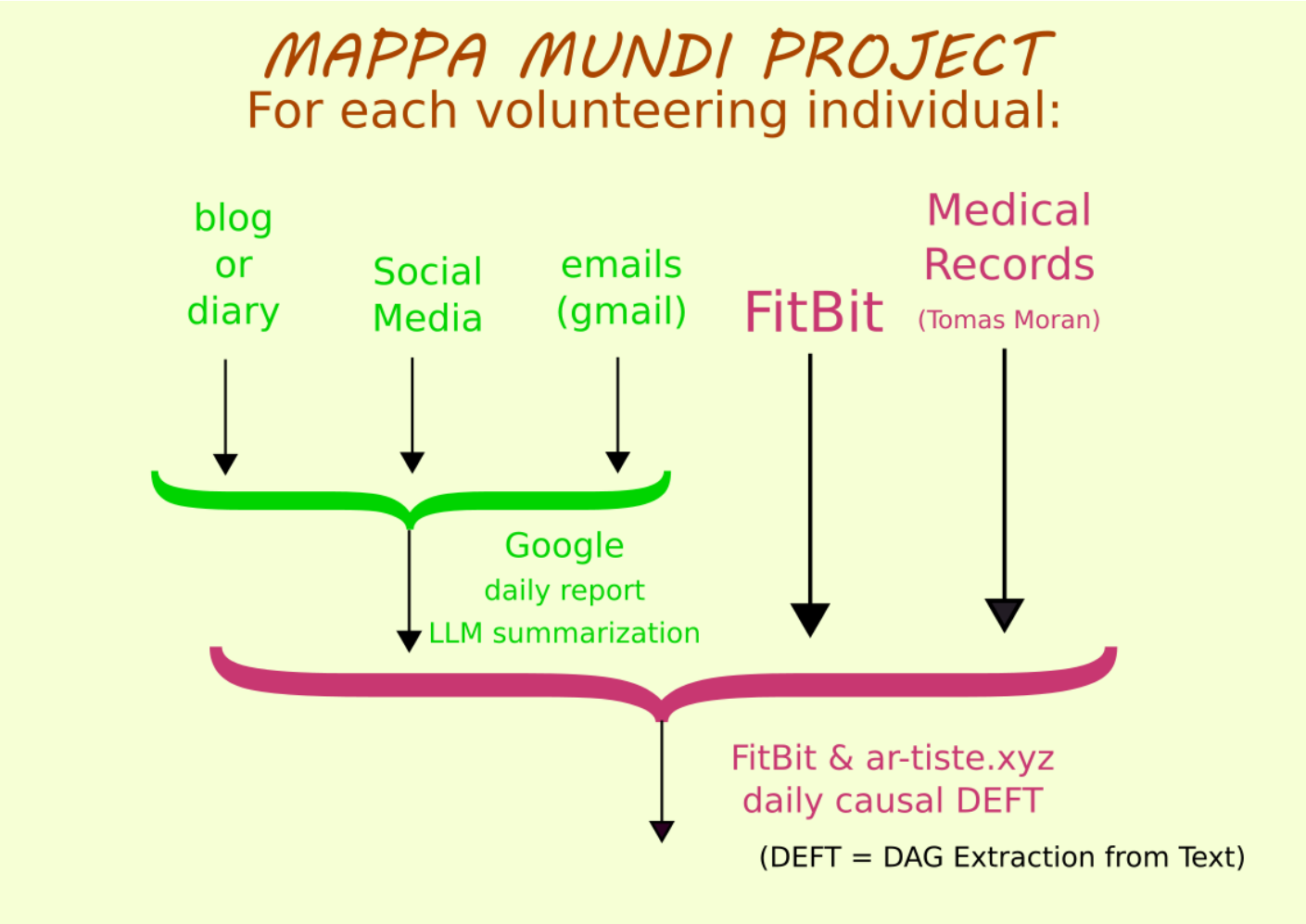
Our software Mappa Mundi accomplishes 1, 2, 3.

MM: 4 apps

SCuMpy, Mappa_Mundi, SentenceAx, CausalFitbit



MM: Finding Causal Pathways for diseases

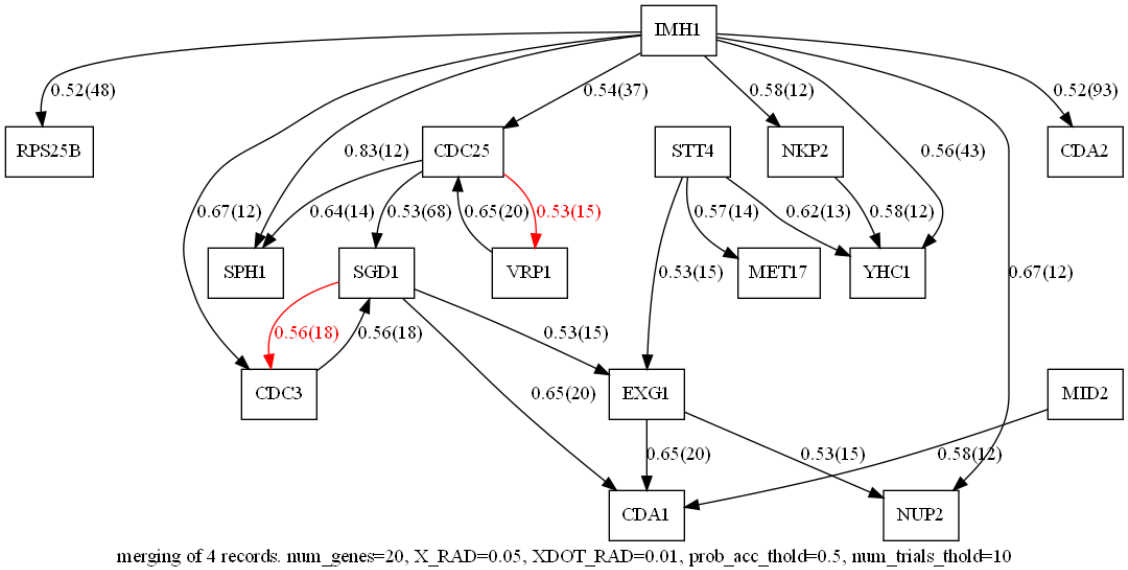


How Google can crush its LLM competitors OpenAI and Meta by Bard-ifying its FitBit product line.

MM: features

- MM is free open source software that extracts causal networks (DAGs) from text.
- MM works with any text that does chronological storytelling, such as novels, movie scripts, time stamped lab notebooks and patient diaries. It can be used to find causal pathways to diseases.
- MM uses 2 types of state of the art (SOTA) LLMs
  1. Openie6 – for SOTA sentence simplification
  2. sentence transformers – for SOTA sentence similarity
- MM is immune to hallucinations because 1 and 2 are immune
- MM is immune to copyright infringement lawsuits because 1 and 2 do not use copyrighted data to train.
- MM can't be hacked by prompt injection because it doesn't use prompts.

Causal Genomics



Gene_Causal_Mapper is a python program for discovering a causal DAG for genes via the MM algorithm.

The software applies the MM algorithm to finding what are called Gene Regulatory Networks (GRN), Autoregulon Nets and Network Motifs in the Genomics and Systems Biology literature.

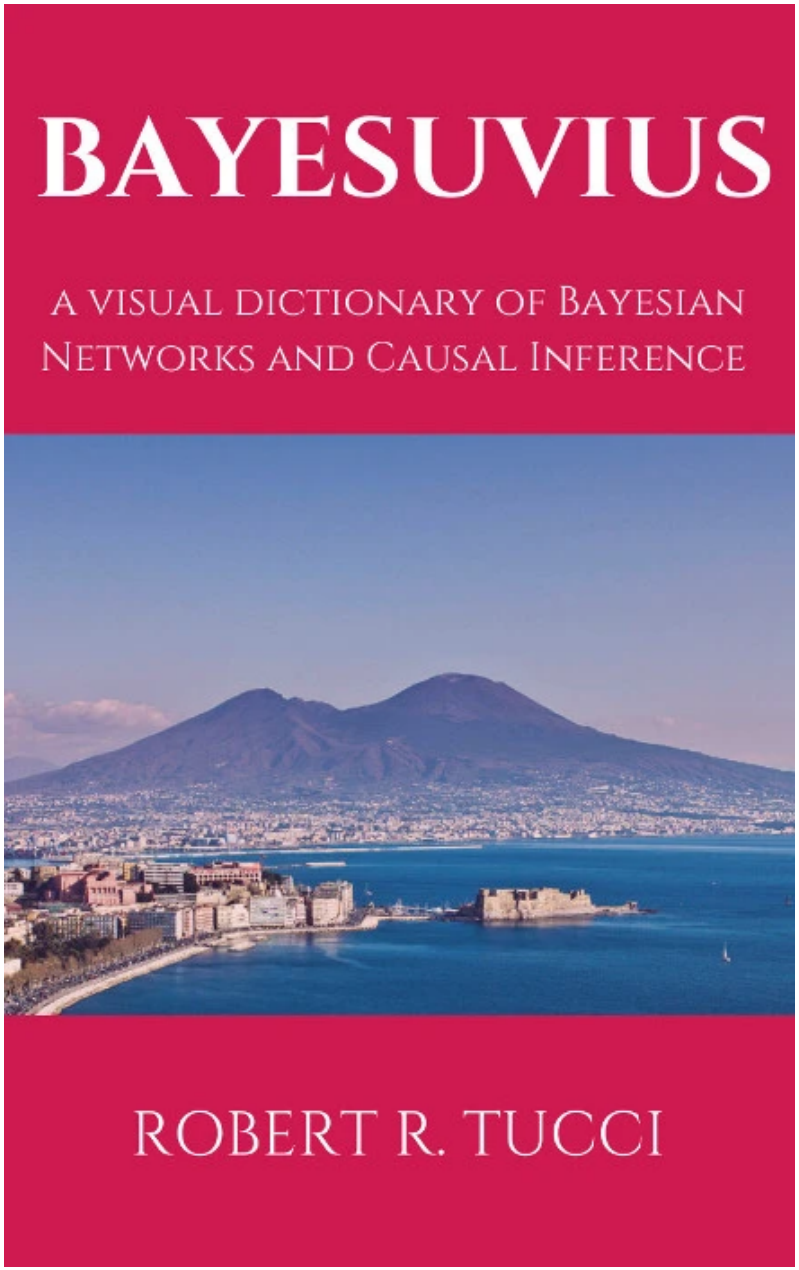
As an example, we apply it to the DREAM3 dataset for yeast.

See also our Causal Genomics Challenge

Flood and Drought Anticipatory Action

We are/were consultants for a project under the auspices of ICPAC (IGAD Climate Prediction and Applications Center) Delivering climate services to Eastern Africa

Book: Bayesuvius



Our free, open source book (1,000 pages). Available in pdf form here.