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Past: Distinguishing between correlation and causation

*"I would rather
discover a single
causal relationship
than be
King of Persia"
Democritus*



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

Present: Clayton Christensen on Causality

“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>





Spock-GPT

science officer of the
starship @OpenAI

Spock-GPT will be able to perform the scientific method and causal inference. This will enable it to discover heretofore unknown causal pathways to diseases, and go where no man has gone before.

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
- ...

Startups applying causal AI to healthcare/biotech

We have written open source software called Mappa Mundi 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)

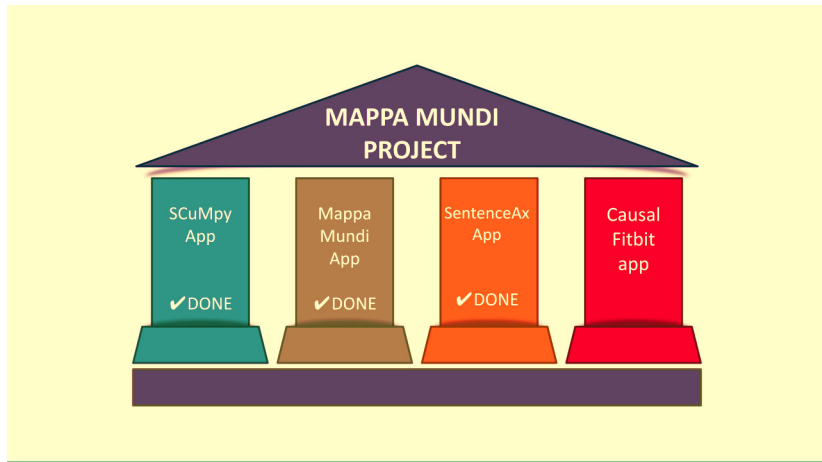
LLMs are currently used merely as exquisite curve fitters. To attain human level intelligence, one needs more than just curve fitters. One also needs to add to LLMs, at the very least, 3 things:

- 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 runs of causal inference and the closely related scientific method

Our software Mappa Mundi accomplishes 1, 2, 3.

MM: 4 apps

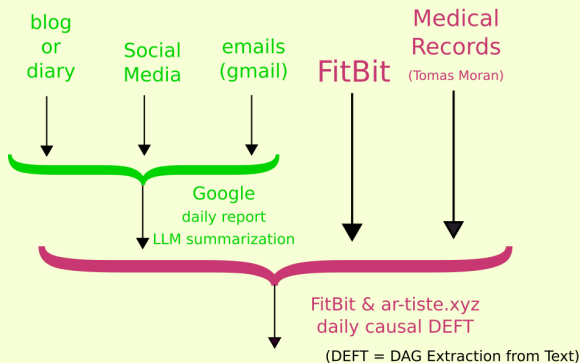
SCuMpy, Mappa Mundi, SentenceAx, CausalFitbit



MM: Finding Causal Pathways for diseases

MAPPA MUNDI PROJECT

For each volunteering individual:

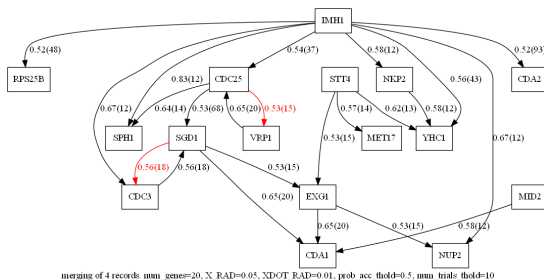


How Google can crush its LLM competitors OpenAI and Meta by Bard-ifying its FitBit product line.

MM: features

- Mappa Mundi (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 did 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 Mappa Mundi (MM) algorithm.

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

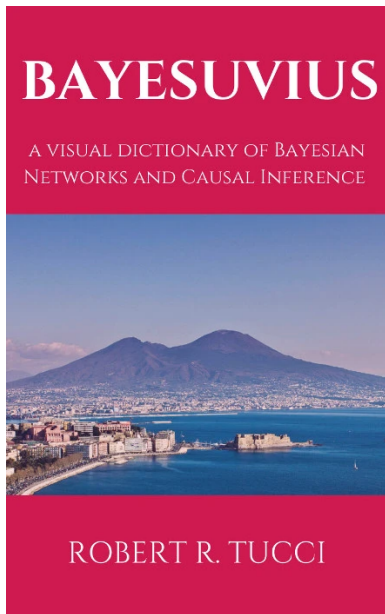
As an example, we apply it to the DREAM3 dataset for yeast.

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.](#)