CAUSALITY LINK

Causal Graphs

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My trajectory

1977-80	1981-83	1984-87	1988-2008	2009-15	2016-21
Fell in love with AI MS, PhD	Management of Research	Expert Systems Research	Rules and optimization Nasdaq in 97 Sold to IBM	Watson and Analytics for GBS	AI and Collective Intelligence

Massachusetts Institute of Technology

Ministry of the Sea

Inria

ILOG

IBM

CausalityLink

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Three important ideas

AI >> ML

ML

- Leverages data about the past
- *To build a statistical model of the future*

Symbolic AI (KG, Ontologies, Expert Systems)

- Leverages present human knowledge
- *To build an explicit model of the future*

Collective Intelligence

A group's IQ is higher than the IQ of any individual

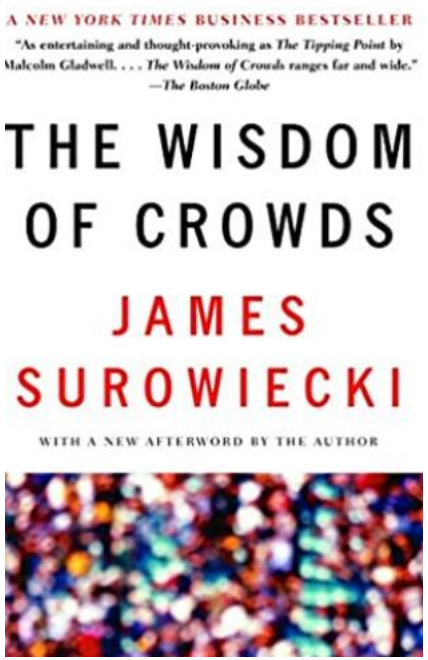
Up to this point, Collective Intelligence has been only applied to Data (Wisdom of Crowds)

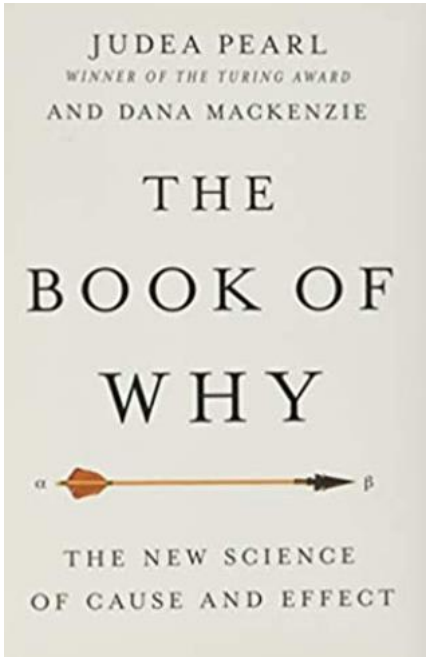
Next: use of AI techniques to explore collective causal knowledge with causal graphs

Our collective explanation of why

We demonstrate it for the forces acting on the financial markets

More reading





Causal Graphs: key concepts

Signal (nodes)

Numbers attached to many "interesting" concepts (indicators):
- Macro-economic concepts (GDP, inflation rate, unemployment rate, FX, …)
- Micro-economic concepts
  - Commodities
  - Companies (revenue, profits, employees, investments…)

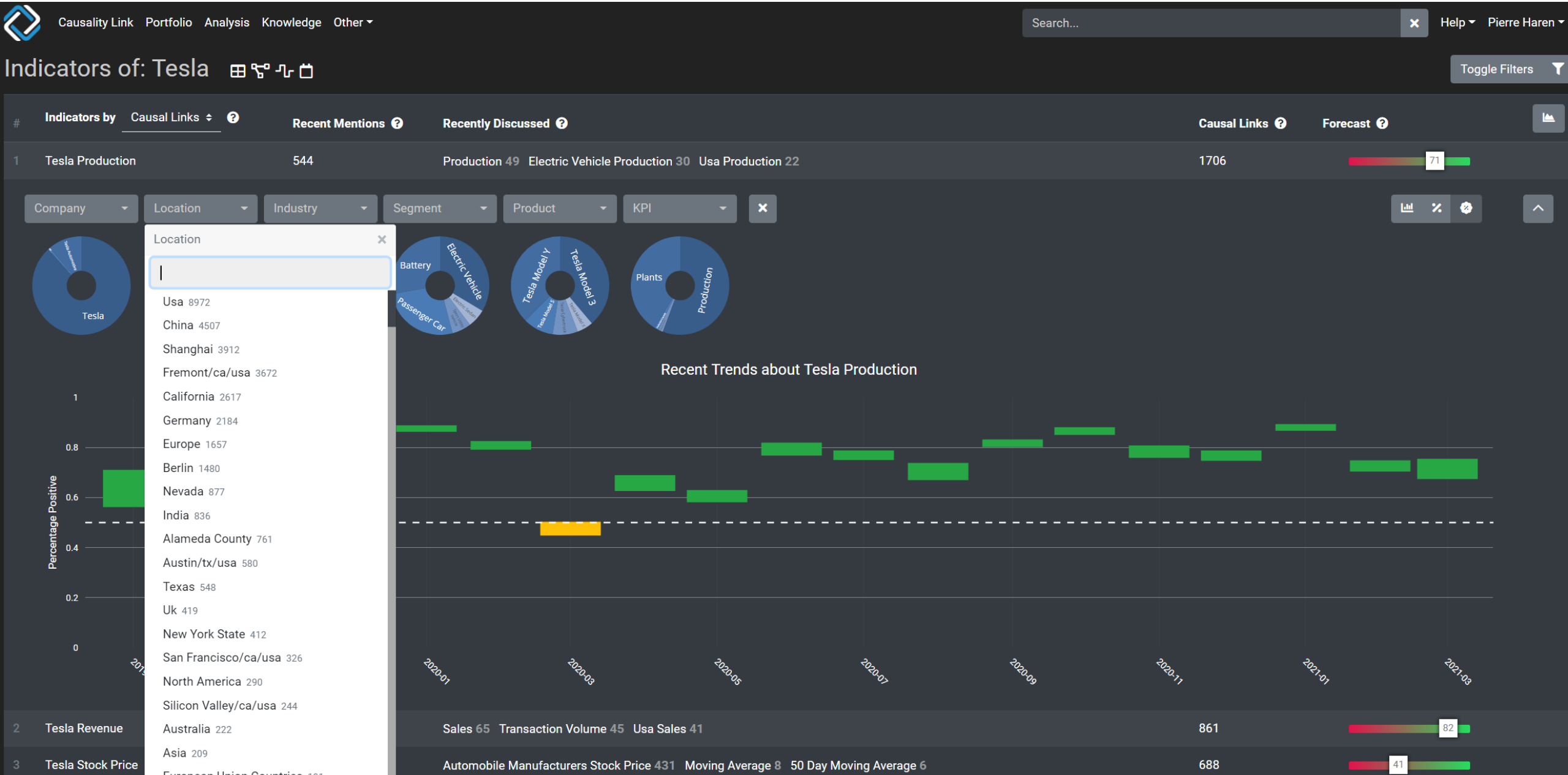
Important events:
- Government decisions and programs (Brexit, Covid Relief Bill)
- Natural disasters

Model (edges or links)

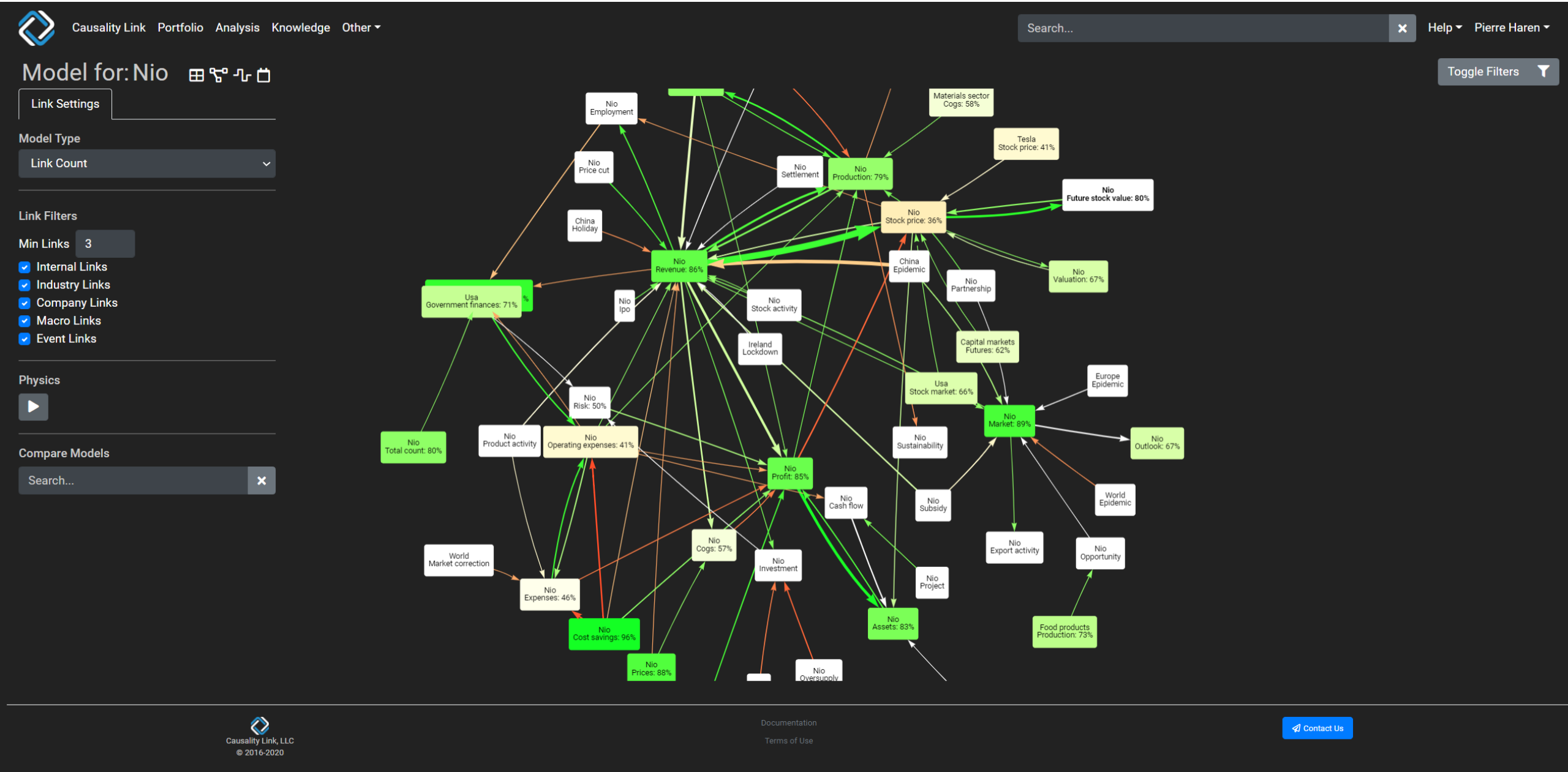
Causal relationships between events and indicators or indicators:
- "The US GDP decline in 2020 is due to the COVID pandemic."
- "Every 5% increase of F-150 sales creates a 10% jump in Ford's profits."

Our “wisdom of crowds” signal vs stock price

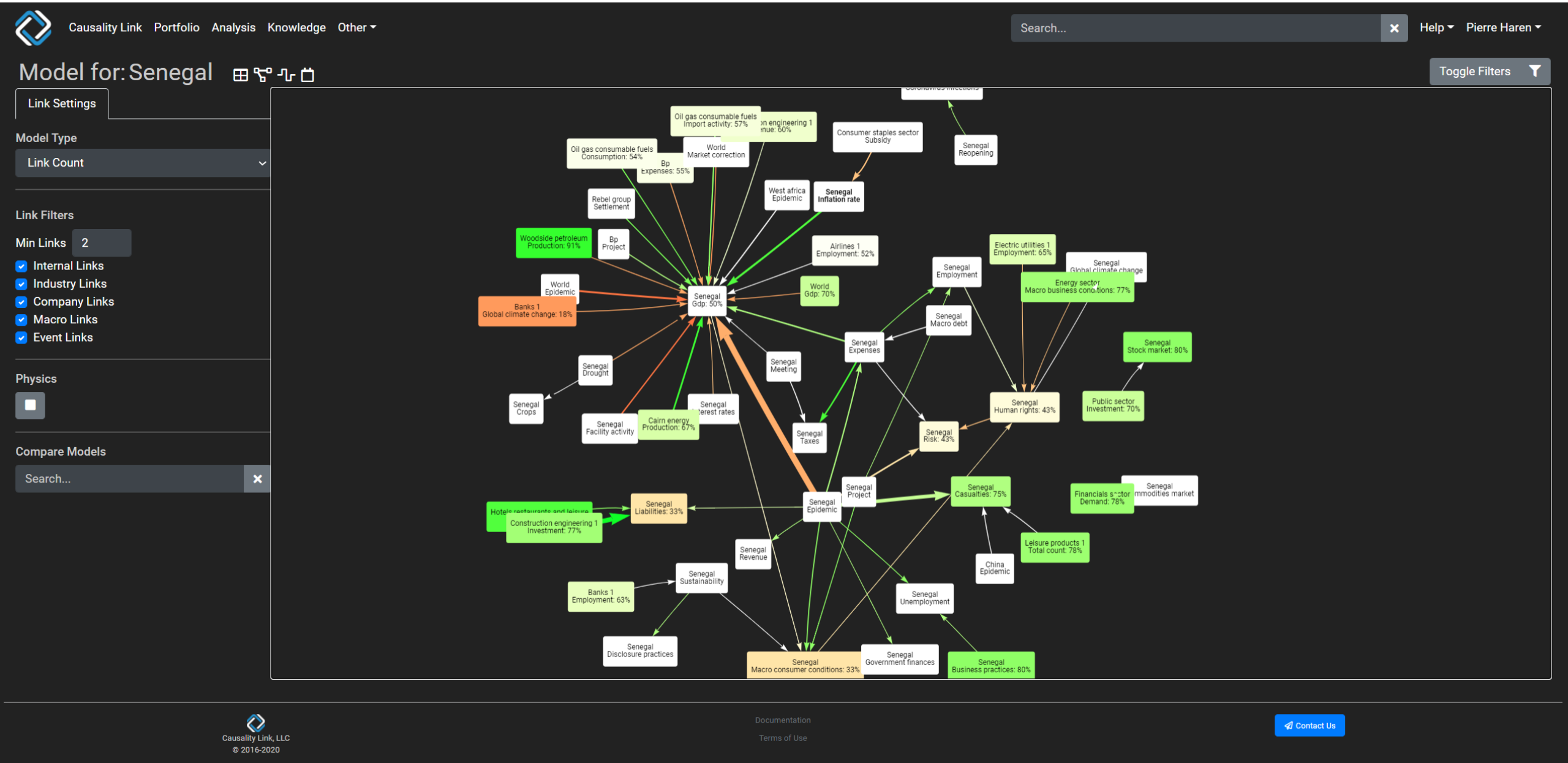
Estimation of the future production of Tesla

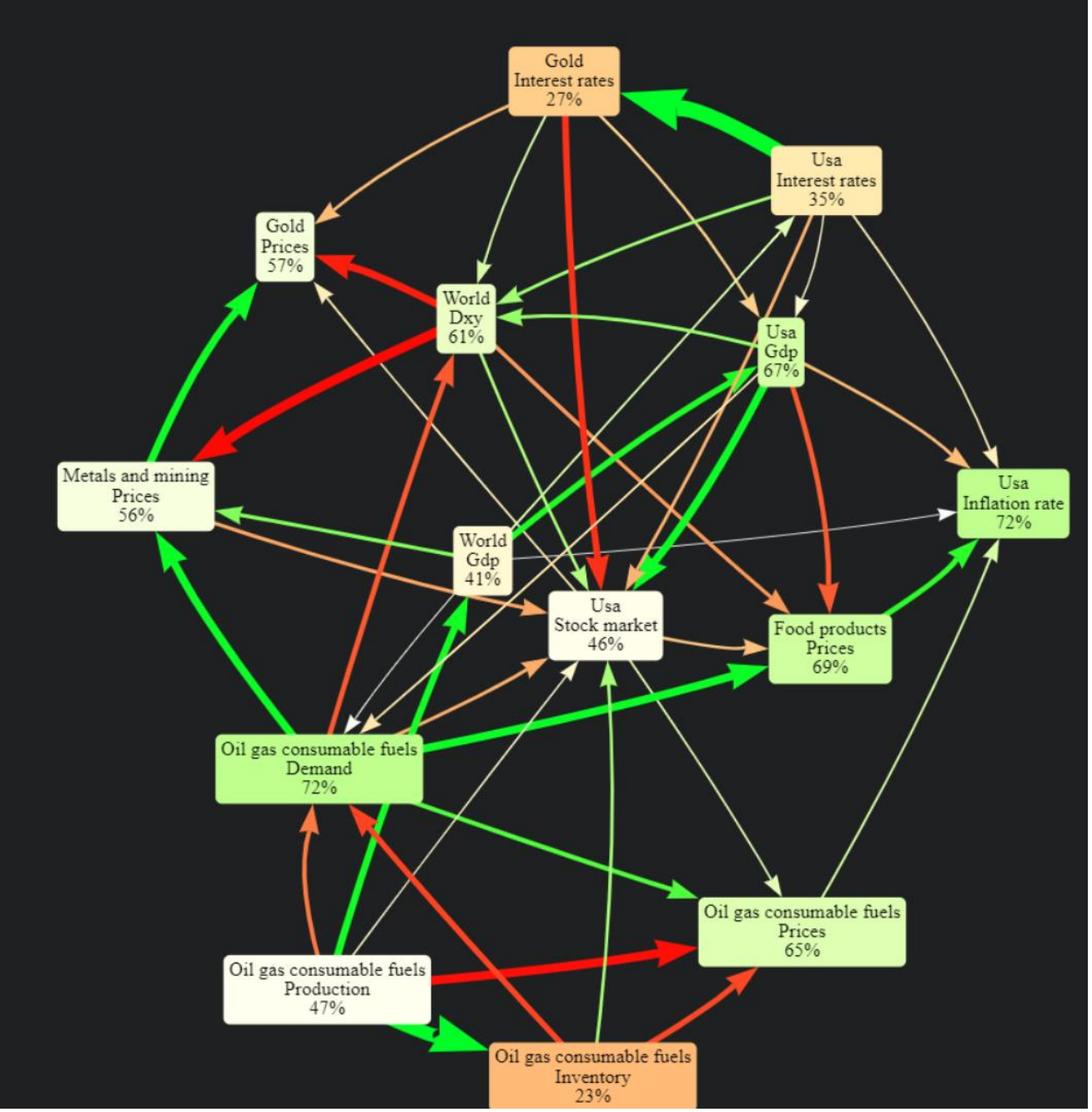


Current NIO causal model



Current causal model of Senegal





A Bayesian Network generated automatically from millions of texts

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3808233

Research topics

AI as a tool to aggregate human knowledge and navigate through it, rather than reinvent it

Causality, next frontier for AI

Causal relationships are more stable than any signal in our rapidly evolving world

Economy, Medicine, Science, Project Management, etc…

Temporal evolution of causal graphs

Collective emergence of accepted causal links