

Mike Placentra II
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My project idea is a platform for approximating Leibniz's Calculus Ratiocinator. The theoretical Calculus Ratiocinator can calculate an answer to any well-formed question we can ask in natural language by tracing propositions back to agreed upon axioms. Many approximations for the Calculus Ratiocinator have been attempted throughout history, often yielding breakthroughs in unrelated areas. For example, Leibniz's own mechanical arithmetic calculator was very far from a complete implementation of a Calculus Ratiocinator, but being able to calculate arithmetic proved extremely useful. More recently, Alan Turing's Turing Machine thought experiment served as a basis for the imperative paradigm of programmable microprocessors, and Alonzo Church's Lambda Calculus led to the development of the functional programming paradigm which has supported many advancements in computer science and is quickly growing as a problem solving platform in industries such as web and finance (in particular, the languages OCaml and Haskell).

The major obstacle in implementing a complete Calculus Ratiocinator is the difficulty in systematically dealing with the organic natures of ontology and grammar as they tie in with questions posed in natural language. Recent attempts at approximations of the Calculus Ratiocinator that attempt to address this have been made in the field of logic, such as head-driven phrase structure grammar.

My platform for approximating the Calculus Ratiocinator would be based on a universal data store that can accommodate all past approximations. This data store would consist of the graph database Titan running on a Cassandra database backend, supporting real-time performance for advanced use-cases. The graph nature of head-driven phrase structure grammar would fit nicely into this data store, and it can accommodate mathematical expressions, propositional logic, lambda calculus more generally, etc., as well as natural language.

The platform would run in a cloud environment with several interfaces to the outside world. The interfaces for everyday users and corporations would be a website and app, which have several use cases. One use case is exploring one's reasoning for a decision. For example, the platform can play devil's advocate with the user to show them the weaknesses in their rationale, or it can give supporting reasons for their argument. Another interface would be an API for it to function as an open graph, supporting Semantic Web and integration with other websites' open graphs, such as Google's knowledge graph and Facebook's entity graph. Finally, it can integrate with online news articles and blogs via javascript, providing a tooltip for the user allowing them to explore the strengths, weaknesses, and connections of the author's statements as the user hovers their mouse cursor over each sentence. Through this mechanism, the platform can be used to compare the beliefs of people and media channels.

Such a platform would greatly impact the world society because it would introduce a new level of logical scrutiny to the public at large, allowing us to make better decisions, political and otherwise. It would provide a new level of transparency and liquidity of information, and reduce the time needed by the average Joe to explore a new topic.

The web interface and app would be ad-supported, but additional logic calculation services can be sold to corporate customers as an advanced decision support system, integrating their personal data into a private version of the platform. The sales description would describe a decision support system that acts as a calculator but for natural-language questions we would ask an expert in any field.