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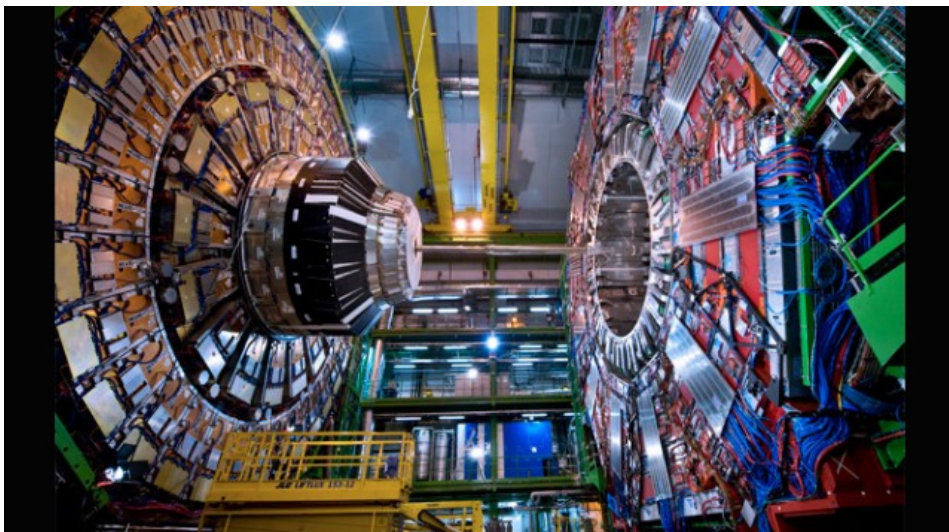
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CERN boosts its search for antimatter with Yandex's MatrixNet search engine tech

By Tim Verry on February 1, 2013 at 8:36 am | 4 Comments



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Russian search giant Yandex is formalizing its partnership with CERN by joining its Openlab program. The latest collaborative effort sees Yandex offering up its proprietary MatrixNet machine learning technology, which powers the

company's internet search engine. CERN, the European Organization for Nuclear Research, plans to harness MatrixNet to analyze and search through the colossal data outputs generated by the use of the Large Hadron Collider (LHC).

Initially, CERN will put MatrixNet to work combing through data sets from the **B-meson decay analysis**, provided by the LHCb experiment (the *b* stands for beauty). Yandex has provided a team of its engineers to assist the researchers in using the MatrixNet software, but the CERN Openlab collaborators are developing a user-friendly front-end interface for the CERN researchers to use in submitting queries on their own.

The LHCb experiments generate colossal amounts of raw data — **as much as 35GB** covering 1 million events per second — which needs to be organized and filtered to find the extremely rare events that the scientists are looking. CERN has systems in place that can pare down the relevant data, but a good chunk of it still requires relatively extensive processing and analysis to determine relevance and usefulness. Needless to say, it is a daunting task.

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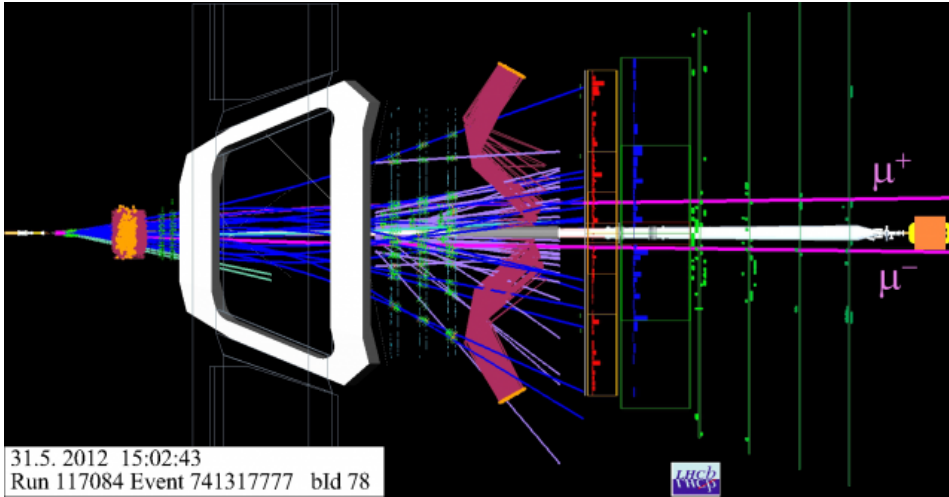
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Fortunately, MatrixNet has cut its teeth on processing approximately 120,000,000 internet search queries per day. Further, it offers up machine learning technology that reportedly taps into algorithms that consider tens of thousands of dynamically weighted factors to find, rank, and return search results. While MatrixNet is not self-aware and cannot make decisions the way a human brain can, it is capable of limited learning by building on previous experience. The MatrixNet technology reportedly has been specifically designed

to process massive data sets using a complex ranking formula while mitigating over-fitting (finding dependencies and relationships between data points that do not actually exist) to present results that are as relevant as possible for a machine to determine.

As MatrixNet was initially developed to search web pages on the internet, it is intriguing to see the search engine technology being used to in the pursuit of scientific discoveries in the real world. Additionally, just as the search engine is being used to improve the efficiency and relevancy of LHC data presented to researchers, the copious amounts of data and search experience gained in analyzing meatspace particle collisions will, in-turn, be used to tweak the MatrixNet technology for searching the internet at large. It is exciting to think that search engine technology may some day help researchers figure out what happened to the universe's antimatter following the Big Bang!

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
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