Sorting Big Data To Research Social Sciences

John Canny
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CURRENT RESEARCH

Creating tools for large scale data analysis and social discovery

We know that Big Data is already changing our world from health, to storage, to communications, but what is needed to accelerate discovery? Dr. John Canny's group at the University of California, Berkeley provides an approach to big data by developing a new way in which computers process and analyze big data.

His team is developing a new tool called the BIDMach to analyze big data using machine learning on very large datasets. BIDMach is unique in several ways often out matching other available tools by several orders of magnitude. The tool can scale to thousands of nodes with 'near-linear' speedup. For math-oriented users its intuitive, like writing math as code and for non-math users it's interactive and works on a high-level by developing visualization tools to make the 'modeling process' itself interactive; helping to develop insights and intuition about the data. And finally, it focuses on a single-machine acceleration first and cluster scale-up second. This approach is important because it takes a different direction that current assumptions; namely that cluster computing is required to approach big data problems and focuses instead on a single-machine performance first leveraging both the CPU and GPU hardware. Evidence has shown that this single-machine performance approach is typically larger than clustering.

- Big Data and Analysis has become a key part of our world in business to science to health. We need better tools to helps us understand and gain insights into the data for useful application. These tools will help in new discoveries when computation of big data is actually a barrier to discovery. BIDMach allows researchers to do now with one...

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AFFILIATION

University of California, Berkeley

EDUCATION

- B.S. in Computer Science and Theoretical Physics 1979 , Adelaide University in South Australia
- Ph.D. in Computer Science 1987 , Massachusetts Institute of Technology
- M.S. in Computer Science 1983 , Massachusetts Institute of Technology

AWARDS

- Machtey Award

RESEARCH AREAS

Technology, Computational Sciences / Mathematics

FUNDING REQUEST

Funding will allow Dr. Canny to explore many directions that he and his team believe will have very large impact, but which the team has been unable to make progress on due to limited resources. These include: scaling deep neural network training, natural language tools and new hardware-accelerated tools for genetic analysis.