

Big Data: Is That a Thing Like Big Hair?

Vicki Stover Hertzberg
30 January 2020

Origin of the Term

Application-Controlled Demand Paging for Out-of-Core Visualization

Michael Cox
MRL/NASA Ames Research Center
Microcomputer Research Labs, Intel Corporation
cox@rea.nasa.gov

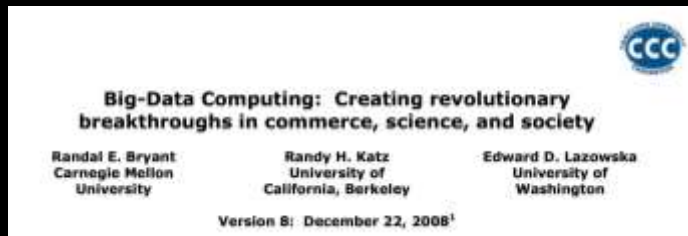
David Ellsworth
MRL/NASA Ames Research Center
ellswcet@amr.nasa.gov

Proceedings of the 8th conference on
Visualization '97 Pages 235-ff.

1 Introduction

Visualization provides an interesting challenge for computer systems: data sets are generally quite large, taxing the capacities of main memory, local disk, and even remote disk. We call this the *problem of big data*. When data sets do not fit in main memory (in core), or when they do not fit even on local disk, the most common solution is to acquire more resources. This write-a-check algorithm has two drawbacks. First, if visualization algorithms and tools are worth developing, then they are worth deploying to user production-oriented scientists and engineers who may have on their desks machines with significantly less memory and disk. Some researchers have noted that their software tools were not used in practice for several years after development because the tools required more power and memory than was available on the average engineer's desk [13]. Second, there may not even be a machine that supports sufficiently large main memory or local disk for the data set one wishes to visualize. We find this in particular in the area of visualization of Computational Fluid Dynamics (CFD).

Origin of the Term



It is from this paper that use of the term entered the mainstream.

Opportunities (and Challenges) Abound!

- **Electronic Health Records (EHR)**
- **Sensors**
- **'Omics**

EHR Opportunities

Project NeLL™ (Nursing electronic Learning Lab)

1 million + unique patients

800 million + unique records

Random sample from Emory Healthcare
patients seen 2012-2017

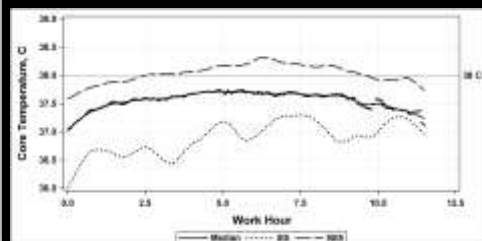
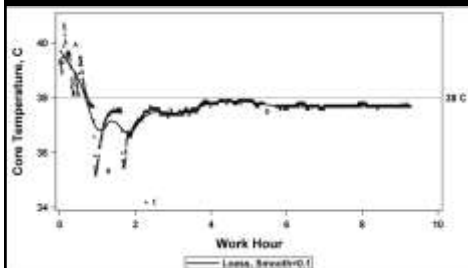
Structured and unstructured data

CARING: Funded by NLM – machine learning from NeLL
to determine and predict nursing quality indicators

CONQUER: Application to NSF – NLP to translate complex
natural language queries to structured query language to
allow nurses to obtain data from NeLL

Sensors

- Girasoles: determine the physiologic effects of heat exposure in Florida agriculture workers
- Girasoles Renal: Determine the long-term effects of heat exposure on renal function



'Omics

- P30 Center for the Study of Symptom Science, Metabolomics and Multiple Chronic Conditions
- Microbiome in the Progression of Amyotrophic Lateral Sclerosis
- And there's more...

Is Big Data a Thing like Big Hair?

Personal Observation



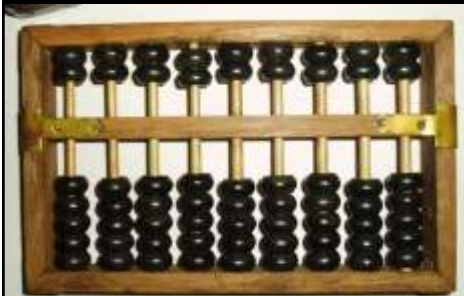
Personal Observation



Personal Observation



Personal Observation



Personal Observation



Personal Observation



Personal Observation



Big Data have always been with us...
And Big Data will always be with us.

Nursing Profession at a Crossroads?

- **What kind of knowledge must be created for effective practice in today's world?**
 - Knowledge is knowledge.
 - Developments in many disciplines are needed to fully understand complex health issues.
- **Information technology has contributed greatly to the rapid developments in science – particularly in biology [and] 'omics.**
- **The challenge is to figure out how to raise the significant questions that are discipline-derived and to contribute to practice-shaped basic science for nursing.**

Roy, C. (2018) Key issues in nursing theory: developments, challenges, and future directions. *Nursing Research* 67(2):81-92.

Nursing Profession at a Crossroads?

How will we integrate multiple ways of knowing?

Roy, C. (2018) Key issues in nursing theory: developments, challenges, and future directions. *Nursing Research* 67(2):81-92.

Nursing Profession at a Crossroads?

“Big data and data science have the potential to provide greater richness in understanding patient phenomena and ... tailoring [interventions] that are personalized to the patient.”

Brennan PF & Bakken S. (2015) Nursing needs Big Data and Big Data needs Nursing. *Journal of Nursing Scholarship* 47:477-484.

**What will computer-assisted nursing
look like?**

**What will computer-assisted nursing
look like?**

Will it be

Hey, Siri...

???

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must step up to**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must ~~step up to~~**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must be at**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must be at**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must form the table to determine the future direction of Computer-assisted Nursing.**

Nursing at the Crossroads

- **Opportunities abound in this era of Big Data.**
- **The profession must embrace the possibilities.**
- **Nursing must form the table to determine the future direction of Computer-assisted Nursing.**
- **The time is NOW.**

Many thanks to

Linda McCauley

Joyce Ho

Roy Simpson

Bonnie Jennings

Vaidy Sunderam

Elizabeth Corwin

What questions do you have?