

WILLIAM R. AND ERLYN J.  
GOULD DISTINGUISHED LECTURE  
ON  
TECHNOLOGY AND THE QUALITY OF LIFE

Nineteenth Annual Lecture

*Visualizing Data: Why an (interactive)  
Picture Is Worth 1000 Numbers*

by

**Miriah Meyer, PhD**

Assistant Professor, School of Computing  
University of Utah



WILLIAM R. & ERLYN J. GOULD AUDITORIUM  
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UNIVERSITY OF UTAH  
NOON, SEPTEMBER 5, 2012

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Picture Is Worth 1000 Numbers*

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**Miriah Meyer, PhD**

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**William R. & Erlyn J. Gould Auditorium**

Sponsored by: The J. Willard Marriott Library  
University of Utah  
September 5, 2012

**Program**  
September 5, 2012

*Welcome*

Joyce L. Ogburn  
Dean, J. Willard Marriott Library  
University Librarian

*Introduction*

David W. Pershing  
President, University of Utah

*2012 Gould Lecturer*

**Miriah Meyer, PhD**  
Assistant Professor, School of Computing  
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## **Miriah Meyer, PhD**

Assistant Professor, School of Computing  
University of Utah

Miriah Meyer is a USTAR assistant professor in the School of Computing at the University of Utah and a faculty member in the Scientific Computing and Imaging Institute. Her research focuses on the design of visualization systems for helping scientists make sense of complex data. She obtained her bachelor's degree in astronomy and astrophysics at Penn State University, and earned a PhD in computer science from the University of Utah. Prior to joining the faculty at Utah, Dr. Meyer was a postdoctoral research fellow at Harvard University and a visiting scientist at the Broad Institute of Massachusetts Institute of Technology and Harvard.

Dr. Meyer was awarded a Microsoft Research Faculty Fellowship in 2012, as well as named to MIT Technology Review's TR35 and Fast Company's list of the 100 most creative people. She is the recipient of a NSF/CRA Computing Innovation Fellow award, and an AAAS Mass Media Fellowship that landed her a stint as a science writer for the Chicago Tribune.

## *Visualizing Data: Why an (interactive) Picture Is Worth 1000 Numbers*

One of the most striking and unique aspects about this moment in human history is the amount of data we are generating. This data holds the promise of unlocking the mysteries of the universe, untangling complex natural and man-made systems, and allowing us to live longer, healthier, and more productive lives. But generating data is only the first step – developing methods to make sense of vast collections of information is now widely considered the major challenge.

A key component of addressing this challenge is visualization, which supports sense making by representing data as pictures and supporting exploration through human-computer interactions. Through the design of intuitive representations of data, visualization designers are able to harness our perceptual system for quickly finding interesting patterns and trends in a sea of data, instead of relying on our more limited memory and cognition. Creating effective visualizations, however, relies on a combination of knowledge about computer science, design, application domains, and how people internalize the meaning of data.

This talk discusses what we know about how to design effective, interactive visualizations, as well as some of the open challenges left to solve. It will also provide examples of how scientists use these tools to glean insight from complex data.

## NOTES

## About the Gould Endowment

**W**illiam R. and Erlyn J. Gould established an endowment in their names, in 1992, in support of the activities conducted within the Utah Science, Engineering, and Medical Archives of the J. Willard Marriott Library. In addition to supporting the archives, the endowment also funds the annual William R. and Erlyn J. Gould Distinguished Lecture on Technology and the Quality of Life, which explores technical and environmental topics, and how they relate to society as a whole.



Erlyn and William Gould

William R. Gould, was one of the world's leading engineers, businessmen, and entrepreneurs and named the Marriott Library as the repository of record for his professional and personal papers spanning more than forty years. As with many of the donors of collections housed in the Utah Science Archives, extensive oral history interviews have been conducted with Mr. Gould, as a supplement to his collection.

By establishing the Gould Endowment and the Gould Distinguished Lecture series, William and Erlyn expressed their desire to share with the public their hope for the future; that through a more complete understanding of technology and its application, perhaps the humanity of which we are all a part may find a stronger path to greater social potential.

In their support of the Marriott Library, the Utah Science Archives, and the Gould Distinguished Lecture series, William and Erlyn Gould established a durable marker by which we may more easily find our way.



# GOULD DISTINGUISHED LECTURE ON TECHNOLOGY AND THE QUALITY OF LIFE

## *Mission Statement*

The William R. and Eryln J. Gould Distinguished Lecture on Technology and the Quality of Life was inaugurated in October, 1992, at the University of Utah's J. Willard Marriott Library.

In establishing the lecture series, William and Eryln Gould both recognized the critical need for continuing public education about issues regarding modern technology and its impact on our daily lives.

Inherent to the advantage of technology is the importance of understanding the ramifications and responsibilities that accompany modern scientific discoveries. Only through continuing public education can scientific fact and social philosophy be successfully merged.

The Gould lecture series is intended to provide a forum for the discussion of problems, issues, experiences and successful case histories of the regeneration and preservation of our communities through the application of modern technology.

It is hoped that an increased awareness of obligation in the public trust will emerge among practitioners of technology as they address the very important environmental and life-deteriorating problems facing society today.

Through interaction between technologists and opinion leaders in communities that are the benefactors of their efforts, a synergism can develop by which society may see great benefit in the long-term future.

This lecture series opens a dialogue among the technologist, the philosopher, the humanist, the private citizen, and all who may wish to assert an active voice in our collective future.

In such an atmosphere of mutual interest and understanding, no one group will be singled out for exclusion or be blamed for society's ills; rather, through understanding, discourse, and public education the positive direction of our future may be shaped.

The Marriott Library's mission is to inspire the creation, discovery, and use of knowledge for Utah and the world. In this light, the annual Gould lecture will strive toward providing a greater public understanding of technology and the social potential that can be cultivated.

In conjunction with the Utah Science, Engineering, and Medical Archives program of the Marriott Library, this lecture series provides the means of bridging the many disciplines of technology while meeting the needs of the public in understanding its rich and diverse technological heritage.

## THE UTAH SCIENCE, ENGINEERING, AND MEDICAL ARCHIVES

The Utah Science, Engineering, and Medical Archive was established in 1985 as a part of the Special Collections department of the J. Willard Marriott Library.

Many individuals associated with Utah have made distinguished contributions to science and its application to business and industry. These advances cover a broad spectrum of creative theoretical contributions, ranging from chemical reactions to cosmic rays, commercial explosives to artificial organs, computer graphics to fossil fuels, sound reproduction to space engineering, laser technology to applied ecology and more.

The Utah Science Archive provides a rich resource for researchers exploring diverse topics in science, medicine, and technology. These include the individual contributions of distinguished scientists and entrepreneurs to group and institutional research of development projects. The complex interactions of science, technology, government, and industry are well documented.

An ongoing search is being conducted to identify materials appropriate for inclusion in the archives. Many prominent Utah-related scientists and entrepreneurs have been contacted and encouraged to deposit their personal and professional papers with the program. The response has been positive, and the archives presently holds over sixty major collections with additional collections committed.

As funding for the archive grows through generous private contributions, the Marriott Library will sponsor more special lectures, university courses, seminars, conferences, and major exhibitions. These educational programs will provide the means of bridging the many disciplines of a major research university campus while meeting the needs of the public in understanding its rich and diverse scientific and technological heritage.

## ABOUT THE J. WILLARD MARRIOTT LIBRARY



Photo by Kelly Peterson

The J. Willard Marriott Library is the flagship academic library for the Utah State System of Higher Education and the largest state-funded academic library in the five-state region of Idaho, Montana, Nevada, Utah, and Wyoming.

In 2009, the Marriott Library completed a four-year, \$79 million renovation project to improve seismic stability, to create new spaces and services meeting the needs of modern students, and to manage collections and technology more effectively. The renovated building now encompasses over 516,000 square feet and can withstand a magnitude 7.2 earthquake.

With an annual gate count of approximately 1.5 million, the Marriott Library is the most widely used building on campus. It provides diverse student learning spaces with access to technology, digital and print information resources, unique primary source materials, and an expert staff. With over 3 million volumes in its collection, the library is integral to the teaching, research, and outreach missions of the University of Utah.

**WILLIAM R. AND ERLYN J.  
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- 1993 Thomas E. Everhart. *Technology and Human Progress  
The Information Revolution*
- 1994 Alan C. Ashton, "A Perfect Journey:" *WordPerfect  
Helping the World Communicate*
- 1995 John Neerhout, Jr. *The Making of the Channel Tunnel:  
A Modern Day Wonder*
- 1996 Edward C. Stone. *Frontiers of Space*
- 1997 Wayne R. Gould. *Energy Eighteen Wheelers: The  
Technological Revolution Within Utility Restructuring*
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- 2000 Christopher R. Johnson. *Computer Simulation and  
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- 2009 Peter Wilhelm. *Sputnik's Connection to GPS : Spacecraft Developments at the Naval Research Laboratory. You may be surprised at the benefits!*
- 2010 Yoky Matsuoka. *Neurobotics: Human-Robot Interfaces Restoring the Quality of Life Through Engineering*
- 2011 David D. Freudenthal. *The Good, The Bad, and the Not So Pretty: Public Policy Leaders and the Evolution of Technology*

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