

# Bill Howe

howeb@stccmop.org  
20000 NW Walker Rd, Beaverton OR, 97006  
(404) 514-3003

## RESEARCH INTERESTS

eScience, democratization of scientific analysis (“citizen science”), scientific databases, scientific visualization, scientific workflow, scientific mashups, pay-as-you-go information integration, dataspace, sensor data processing and management, distributed computing architectures (appliances; clouds; grids)

## EDUCATION

### Portland State University

Ph.D. in Computer Science, December 2006

Thesis: *GridFields: Model-Driven Data Transformation in the Physical Sciences*

Advisor: David Maier

*Selected as PSU's submission to the 2006 ACM SIGMOD Dissertation Awards*

*Ranked Fourth for 2006 ACM SIGMOD Dissertation Award*

### Georgia Institute of Technology

BS (with Honors) Industrial and Systems Engineering, March 1999

## EMPLOYMENT

May 08 – present

**Oregon Health & Science University**, Beaverton OR

Senior Scientist

Center for Coastal Margin Observation and Prediction (CMOP)

Activities:

- Project Lead: *eScience Appliance: Workflow, Visualization and Data in a Box*, with Roger Barga at Microsoft Research (awarded a Jim Gray Seed Grant)
- Frontline Mentor, Research Experience for Undergraduates, *Bioinformatics in the Cloud*, Summer 2008, Student: Chantel Johnson, Clark Atlanta University
- Project Lead: *The Product Factory: Towards Scientific Mashups with Zero Programming.*
- Project Lead: *GridFields + VisTrails: Algebraic Manipulation of Ocean Circulation Models*

Feb 08 – present

**Collaborative Research on Oregon Ocean Salmon (Project CROOS)**

Consultant

Oct 07 – Jun 08

**Portland State University**

Project: Data Integration and Exploitation System that Learns (DIESEL)

Consultant

Sep 06 – May 08

**Oregon Health & Science University**, Beaverton OR

Senior Research Associate, Data Architect

Center for Coastal Margin Observation and Prediction (CMOP)

Activities:

- Led recruitment activities at Clark Atlanta University, a historically black college in Atlanta, GA
- Frontline Mentor, Research Experience for Undergraduates, *Incorporating Human Judgment in Scientific Workflows*, Summer 2007, Student: Nicholas Hagerty, Brown University
- Designed and implemented a lightweight “best-effort” database replication system for unreliable wireless networks. Deployed on CMOP oceanographic research cruises over the Ship-to-Ship Wireless Access Protocol (SWAP)

- Designed and implemented the *Product Factory*, a framework for generating dynamic visualizations on the web, replacing canned, static images with configurable data products
  - Designed and implemented *OOSDB*, the data integration platform for the SATURN Ocean Observatory
  - Co-authored successful proposal for the data management arm of the Northwest Association of Networked Ocean Observing Systems (NANOOS).
  - Data integration lead for NANOOS Data Management and Communications
  - CMOP representative to the national Integrated Ocean Observing System
- Oct 00 – Aug 01    **Independent Consultant**  
 Technical Lead, **Microsoft Consulting Services**, Redmond, WA  
 Redesigned interfaces between third-party time and expense software and Microsoft's internal legacy systems, removing 50% of the manual procedures. Voted "favorite developer" by QA team.
- Sep 00 – Oct 00    **Independent Consultant**  
 Lead Developer, **Schlumberger Oil Services**, Houston, TX  
 Designed, built, and deployed a rule-based application for constructing complex orders on the web to meet a three-week trade show deadline. Led the technical team of three.
- Aug 00 – Sep 00    **Deloitte Consulting**, Seattle, WA  
 Systems Analyst, **Verizon Wireless**  
 Researched requirements for the Wireless Billing System and co-authored the RFP.
- Sep 99 – Aug 00    **Deloitte Consulting**, Atlanta, GA  
 Systems Analyst, Project for **EXCEL Communications**, Dallas, TX  
 Integrated call center software with legacy billing and order systems as part of a 100+ person team helping EXCEL break into the newly deregulated local telephone market. Acted as technical "subject matter expert" regarding systems integration.
- Jan 95 – Apr 95    **Delta Airlines**, Atlanta, GA  
 Systems Support (Co-op), Technical Operations Division  
 Earliest database programming experience. Hired to support the staff by running a variety of reports, I redesigned their Microsoft Access database and automated ~75% of my data entry and report creation duties, effectively eliminating my position!

## REFEREED PUBLICATIONS

### **Quarrying Dataspaces: Schemaless Profiling of Unfamiliar Information**

Bill Howe, Nicolas Rayner, James Rucker, David Maier, Workshop on Information Integration Methods Architectures and Systems, 2008 (IIMAS 2008, with ICDE 2008)

### **The Ocean Appliance: Complete Platform Provisioning for Low-Cost Data Sharing**

Bill Howe, Nicholas Hagerty, Ethan Van Matre, David Maier, António Baptista, Charles Seaton MTS/IEEE Oceans 2007, Vancouver, BC, Canada, October 2007

### **Smoothing the ROI Curve for Scientific Data Management Applications**

Bill Howe, David Maier

3rd Biennial Conference on Innovative Data Systems Research, January 2007. (CIDR 2007)

### **GridFields: Model-Driven Data Transformation in the Physical Sciences**

Bill Howe

Ph.D. Dissertation, Portland State University, Maseeh College of Engineering and Computer Science, December 2006

**Managing the Forecast Factory**

Laura Bright, David Maier, Bill Howe

Workshop on Scientific Workflows, 2006. (SciFlow 2006, with ICDE 2006)

**Algebraic Manipulation of Scientific Datasets (extended)**

Bill Howe, David Maier

The VLDB Journal, 14(4), November 2005

**Querying and Visualizing Gridded Datasets for e-Science (demo)**

Bill Howe, David Maier. (demo)

International Conference on Data Engineering, 2005. (ICDE 2005)

**Retrofitting a Data Model to an Existing Environmental Repository**

Bill Howe, David Maier

Statistical and Scientific Database Management Conference, 2005. (SSDBM 2005)

**Emergent Semantics: Towards Self-Organizing Scientific Metadata**

Bill Howe, Kuldeep Tanna, Paul Turner, David Maier

International Conference on Semantics for a Networked World, 2004. (SFNW 2004, co-located with SIGMOD 2004)

**Algebraic Manipulation of Scientific Datasets**

Bill Howe, David Maier.

International Conference on Very Large Databases, 2004. (VLDB 2004)

**A Language for Spatial Data Manipulation**

Bill Howe, David Maier, Antonio Baptista

Journal of Environmental Informatics, 2(2), December 2003

**INVITED PUBLICATIONS****Scientific Exploration in the Era of Ocean Observatories**

Antônio Baptista, Bill Howe, Juliana Freire, David Maier, Cláudio T. Silva

Computing in Science and Engineering 10(3), May/June 2008, pp 53-58

**Logical and Physical Data Independence for File Based Scientific Applications**

Bill Howe, David Maier

IEEE Data Engineering Bulletin, 27(4), 2004

**Modeling Data Product Generation**

Bill Howe, David Maier

Workshop on Data Derivation and Provenance, co-located with the Global Grid Forum, 2002, Chicago, IL. (GGF 2002)

**HONORS**

- Jim Gray Seed Grant, Microsoft Research, \$25,000, April 2008. Project: *The eScience Appliance*
- Commendation Award for Maseeh College of Engineering and Computer Science, Portland State University, May 2007
- Best of VLDB 2004, one of 4 best papers (of 81) selected for publication in VLDB Journal.
- Research Proficiency Exam passed “with distinction,” March 2003
- Graduated with Honors, Georgia Tech, March 1999

**ADVISING AND TEACHING**

Fall 2008	Instructor, <i>Visual Data Analysis</i> Saturday Academy (extra curricular academic program for high school students)
Summer 2008	Frontline Mentor, Research Experience for Undergraduates Student: Chantel Johnson, Clark Atlanta University

Project: *Incorporating Human Judgment in Scientific Workflows*

Summer 2007 Frontline Mentor, Research Experience for Undergraduates  
Student: Nicholas Hagerty, Brown University  
Project: *Incorporating Human Judgment in Scientific Workflows*

Spring 2007 Mentor, Master's Student Independent Research Project  
Student: Darin Toy, OHSU  
Project: *Individual-Based Biological Modeling in Python*

Summer 2006 Instructor, Scientific Data Management. Co-teaching with Laura Bright, Ph.D.  
Portland State University,. (<http://www.cs.pdx.edu/~howe/cs410>)

Spring 2004 Teaching Assistant, Object Data Management, OHSU

Fall 2003 Teaching Assistant, Principles of Databases, OHSU

#### **PROFESSIONAL SERVICE**

Reviewer, VLDB Journal, December 2008  
Program Committee, IIMAS Workshop, ICDE 2008  
Demonstrations Program Committee, SIGMOD 2005  
Program Committee, dg.o 2005, dg.o 2006