Proposal
Creating an AALAC Working Group on "Information"

Submitted to
Alliance to Advance Liberal Arts Colleges (AALAC)

By
Bryn Mawr, Pomona, Swarthmore, Wellesley, Williams

Coordinator: Deepak Kumar (Bryn Mawr College)

Goals: The goal of this proposal is to leverage the existing interests of faculty at AALAC institutions and bring together a more focused and contemporary perspective on the emerging role of "information" and its scientific and philosophical relevance to the 21st century intellectual inquiry. A working group of interested faculty from several disciplines will come together for a 2-day workshop at Bryn Mawr to learn and discuss ways in which this perspective could enrich scholarship as well as curricula at AALAC institutions.

Background: Published in 1948, Claude Shannon's foundations of **information theory** have paved the way for data storage, compression, encoding, and transmission for the Internet, CDs, DVDs, MP3 players, JPEGs, WiFi, iPODs, mobile phones, and a whole host of applications underlying today's information technologies. Together with the advent of the transistor (also at Bell Labs around the same time) and its subsequent impact on the development of digital computers, the so called information age relies heavily on the principles of information theory. The past six decades have brought information theory to the crossroads of several traditional disciplines: mathematics, statistics, computer science, physics, biology, neurobiology, electrical engineering, history, and philosophy. While classical information theory focused solely on the ideas of storing and transmission of information, scientists have come to recognize that information plays a more central role that can help advance our understanding of a diverse range of phenomena in several disciplines. In 2010 the National Science Foundation (NSF) funded a 5-year Science and Technology Center (STC) to explore the emerging frontiers of the new Science of Information. This Center for Science of Information (www.soihub.org) is centered at Purdue University and involves scientists, social scientists, and humanists from Bryn Mawr, Howard, MIT, Princeton, Stanford, Texas A&M, UC-Berkeley, and UC-San Diego. The mission of the center is **to advance science and technology through a new quantitative understanding of the representation, communication, and processing of information in biological, physical, social, and engineered systems**.

In the Fall of 2011 a Working Group of ~20 faculty and students from Bryn Mawr and Swarthmore started a weekly discussion group on "the philosophy of information". It was a multidisciplinary group consisting of biologists, computer scientists, economists, historians, and philosophers. We discussed a recent book by Luciano Floridi, *Information: A Very Short Introduction (Oxford, 2010)*, and Shannon's 1948 paper, *The Mathematical Theory of Communication (U. Illinois, Reprinted as Shannon & Weaver)* as background material. Members of this group also read James Gleick's, *Information: A History, A Theory, A Flood (Pantheon, 2011)*.Gleick's book eloquently lays out the case for the need for more advances in the science of information which it turns out is also the primary agenda for research of the

NSF sponsored Center for Science of Information (CSoI). In the Fall of 2012, Bryn Mawr will be offering a pilot undergraduate junior/senior-level course titled, *Science of Information*, that introduces this new and emerging field to students. Students from all disciplines will be invited to enroll. One of the outcomes expected from this workshop will be a sharing of the course materials and, more importantly, a reflection on the content, nature, and scope of this and other similar courses being offered by participants at their own institutions. For example, At Pomona College, Prof. Tzu-Yi Chen (Pomona) recently offered a freshman critical thinking seminar titled, *From Information to Knowledge*. Prof. Panagiotis Metaxas (Wellesley) has offered a course titled, *The Socio-Techno* Web. Others at AALAC have either taught courses in this vein or are interested in creating future offerings.

Outcomes: The proposed 2-day workshop will bring together faculty from AALAC institutions to learn about the latest ongoing research at the CSoI, to share their perspectives, and to discuss ways in which a more sustainable cross-institutional Working Group could be created. While our workshop leaders are primarily from Computer Science we will actively seek at least 50% participation from interested faculty in other disciplines. In addition to the participants, we will have two invited speakers (chosen from CSoI researchers and also possibly James Gleick and Luciano Floridi). Among the outcomes from this workshop are: collaborative creation and sharing of course materials and resources for use in courses; and a longer term, sustainable Working Group of Information. This effort, as well as future meetings of the Working Group, will be supported additionally by the resources from CSoI of which Bryn Mawr is a member.

Workshop Leaders

Deepak Kumar, Computer Science - Bryn Mawr College (Project Leader)
Duane Bailey, Computer Science – Williams College
Tzu-Yi Chen, Computer Science – Pomona College
Panagiotis T. Metaxas, Computer Science – Wellesley College
Mike Sears, Biology – Bryn Mawr College
Richard Wicentowski, Computer Science – Swarthmore Collage

Designated Workshop Liaison

Deepak Kumar
Professor of Computer Science
Bryn Mawr College
Bryn Mawr, PA 19010
dkumar@cs.brynmawr.edu

Preliminary Budget

Travel & Lodging for 12 participants @ $1000/per participant	$12000.00
Meals (2 Dinners, 2 Lunches, 4 Snacks, 2 Coffee)	$ 5500.00
Local Transportation for participants	$ 250.00
Materials (Copying, duplication, mailing, publicity)	$ 200.00
Honoraria for two speakers @ $750 each	$ 1500.00
Staff Support (Two students for 30 hours @ $9.00/hour)	$ 540.00
Total Requested	**$19990.00**

Budget Justification

We expect between 20-25 participants at the workshop, which we are tentatively scheduling for Fall 2012. At least ten participants will be from out of town. Funding is requested for travel and lodging of twelve participants to include the two invited speakers. We expect several local participants to attend (see list below) but we will not require funds for their travel etc. Local transportation expenses relate to the costs of hiring a college van to bring participants from their lodging to the campus. We are requesting $750 for honoraria for each of the two speakers. If the speakers are from CSoI, no honoraria will be needed. We are not requesting any stipend for workshop organizers.

Local Participants

The following local members of the Philosophy of Information Group will most likely participate:
Alan Baker, Philosophy – Swarthmore College
Douglas Blank, Computer Science – Bryn Mawr College
Tim Burke, History - Swarthmore College
Wil Franklin, Biology - Bryn Mawr College
Karen Greif, Biology - Bryn Mawr College
Steven Gutstein, Computer Science - Bryn Mawr College
Charles Kelemen, Computer Science - Swarthmore College
Mark Kuperberg, Economics - Swarthmore College
Lisa Meeden, Computer Science - Swarthmore College
Matt Weinberg, Economics - Bryn Mawr College
Joshua Shapiro, Biology - Bryn Mawr College
Elliott Shore, History - Bryn Mawr College
Michael Tratner, English - Bryn Mawr College
Dianna Xu, Computer Science - Bryn Mawr College

Duane A. Bailey Williams College

Department of Computer Science
47 Lab Campus Drive
Williamstown, Massachusetts 01267
(413) 597-2417/bailey@cs.williams.edu

Education

- Ph.D. *Computer and Information Science*
  University of Massachusetts, Amherst, May 1988.
  Specifying Communication for Massively Parallel Ensemble Machines
- B.A. *Mathematics & Physics*
  Amherst College, May 1982.
  On Subdirect Sums of Rings.

Memberships, Honors, and Awards

- Member ACM, IEEE, CRA, and AAAS.
- American Electronics Association Fellow, 1984-7.
- Walker Prize in Mathematics (First), Amherst College, 1978.

Professional Experience

- *Professor of Computer Science*, Williams College, 1988-present.
  An independent computer science department at a competitive liberal arts institution.
- *Visiting Scholar*, University of Texas, Austin, Spring 1992.
  Sponsored by J.C. Browne.
- *Research Assistant,* University of Massachusetts, 1982-8.
  With Janice Cuny; specification and performance of parallel algorithms and architectures.
- *Co-founder*, Rescon Associates, Incorporated, Salem, New Hampshire, 1983.
  An educational and technical consulting firm for the early computer industry.
- *Software Engineer*, Digital Equipment Corporation, Nashua, 1981-2.
  Built kernel performance analysis tools; VMS development group.

Research Interests

- High performance programming environments, hardware, languages and algorithms. Tiling theory. Graph grammars and L-systems. Algorithmic information theory. Bioinformatics and biological-based models of computation.

Publications (selected)

- Olle Balter and Duane A. Bailey.
  Enjoying Python, Processing and Java in CS1.
  ACM Inroads, vol. 1, no. 4, pp. 28-32, December 2010.
- Duane A. Bailey and Janice E. Cuny.
  Programming with very large graphs.
  International Workshop on Graph Grammars, LNCS 532:84-97, 1991
- Duane A. Bailey, Janice E. Cuny, and Craig P. Loomis.
  ParaGraph: graph editor support for parallel programming environments.
  International Journal of Parallel Processing, August 1990.
- Duane A. Bailey, Janice E. Cuny, and Bruce B. MacLeod.
  Reducing communication overhead: a parallel code optimization.
  Journal of Parallel and Distributed Computing, pp. 505-520, October 1987.

Books

- *Python Structures* (tentative title), a data structures text in preparation.
  Available with supporting libraries Summer or Fall 2012.
- *Java Structures: Data Structures in Java for the Principled Programmer.*
  Two editions printed through McGraw-Hill, 1998, 2004.
  Translated to Chinese and Korean.

Third edition now available (and widely used) as free e-book at
http://www.cs.williams.edu/~bailey/JavaStructures

- *Java Elements: Principles of Programming in Java.*
  With Duane W. Bailey, 2000.
  Still in print. Also available in Chinese.

Seminars, Panels, and Colloquia (selected)

- *In Search of a Programmable Tattoo,* Summer Science Talk, Williams College, 8/2011
- *Developing Creative Assignments,* Gaudino Forum presentation, Williams College, 3/2009
- *Breaking Moore's Law*, Summer Science Talk, Williams College, 6/2007.
- *Life as an Algorithm* in *Rethinking CS101: Engaging Students from the Arts and Sciences in Computer Science*, Computer Research Association, Snowbird, 6/2005.
- *Use of Computational Theories in Biology*, Quality Education for Minorities Workshop for Biology and Mathematics, Baltimore, 5/2005.
- *Cellular Life and Computation*, Invited ΣΞ talk
  University of North Carolina, Greensboro, 1/2005.
- *An (Almost) Universal Sponge Tile*, Dept. of Mathematics, Williams College, Spring 2001.

Honors Students and Related Research (most recent)

- Rubin, Steve. *Visualizing Large Communication Graphs,* May 2011. (Berkeley)
  Also, *A microcoded processor for an FPGA.* Finalist, 2009 SIGSCE research competition.
- Wadden, Jack. *The Feasibility of Dynamically Configurable Research Systems*, Senior research project, December 2010. (Virginia)
- Effinger-Dean, Laura, *The Empire Problem in Penrose Tilings*, May 2006. (Washington)
- Hirshman, Brian, *Virtual Machines: Features and Futures*, May 2006. (CMU)
- Cyll, Topher, *Cache-Conscious Memory Management*, May 2004. (Cogo Labs)
- Chen, Kai, *DNA-to-DNA Computation*, December 2003. (Microsoft)
  Poster abstract in *Journal of Computing Sciences in Colleges*, vol. 18, no. 5, May 2004.
- Zhu, Feng, *Search for a Universal Tile*, May 2002.
- Munson, Miles A., *Caching Strategies for the Java Virtual Machine*, May 2001. (Cornell)

Courses Taught (selected)

- Life as an Algorithm (Information theory themes in Bio and CS, taught at Williams and Bennett Colleges), Computer Organization, Algorithms, Operating Systems, Modern Computer Architecture, Parallel Processing, and Informatics side of Bioinformatics, Genomics, and Proteomics lab course (Bio 319).

Professional Service and Synergistic Activities (selected, recent)

- National Lab Day. Brought digital logic to curriculum of Pittsfield High (Pittsfield, MA), 2009-present. Developing < $20 logic workbench for national distribution.
- NSF CS AP Advisory Committee, September 2008-present.
- Computational Thinking Technical Committee, Education Dev. Center, 2010-11.
- Foundation for Excellence in Schools' Arthur Vining Davis Fellow.
  With Bolton Central School (Bolton Landing, NY), Theodore Roosevelt High School and the Academy for Environmental Sciences (both in New York City), 2001-3.
- Jack Kent Cooke Foundation, Fellowship Review Committees, 2002-present.
- Barry M. Goldwater Scholarship. National review committee. February 1998 to present.

Personal Statements (selected)

- I was forced to learn physics by reading Feynman's Lecture Series after I electrocuted my high school physics teacher with his Van de Graff generator. I've had no regrets. Young minds need to be occupied with stimulating and creative assignments that allow them to make discoveries in their own way.
- Red Sox fan. Non-negotiable.

TZU-YI CHEN, ASSOCIATE PROFESSOR OF COMPUTER SCIENCE

CONTACT INFORMATION

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Computer Science Department
185 East Sixth St
Claremont, CA 91711

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EDUCATION

Ph.D. in Computer Science, University of California at Berkeley	2001
M.S. in Computer Science, University of California at Berkeley	1998
S.B. in Computer Science, S.B. in Mathematics, Massachusetts Institute of Technology	1995

FACULTY RANKS

Department Chair, Computer Science, Pomona College	2009–present
Associate Professor of Computer Science, Pomona College	2008–present
Assistant Professor of Computer Science, Pomona College	2002–2008
Visiting Scholar, San Diego Supercomputer Center	2005–2006

SELECTED PUBLICATIONS

Using reinforcement learning to vary the m in GMRES(m), Lisa Peairs[1] and Tzu-Yi Chen. Proceedings of the 2011 International Conference on Computational Science. Singapore, June 2011. Also Procedia Computer Science, 4: 2257–2266. June 2011.

Leveraging existing outreach programs to reach underrepresented minorities, Maribel Gonzalez[1], Lucy Vasserman[1], Sara Owsley Sood, and Tzu-Yi Chen. Journal of Computing Sciences in Colleges, 26(4): 190–196. April 2011.

Commonsense understanding of concurrency: computing students and concert tickets, Gary Lewandowski, Dennis Bouvier, Tzu-Yi Chen, Robert McCartney, Kate Sanders, Beth Simon, and Tammy VanDeGrift. Communications of the ACM, 53(7): 60–70, July 2010.

On using reinforcement learning to solve sparse linear systems, Erik Kuefler[1] and Tzu-Yi Chen. Proceedings of the 2008 International Conference on Computational Science. Krakow Poland, June 2008. Also Lecture Notes in Computer Science, 5101: 955–964, 2008.

Performance prediction and ranking of supercomputers, Tzu-Yi Chen, Omid Khalili, Roy L. Campbell Jr., Laura Carrington, Mustafa Tikir, and Allan Snavely. Chapter 3 (pages 135–172) in High Performance Computing, volume 72 in series Advances in Computers. Academic Press, 2008.

Commonsense computing: Debugging (Episode 4), Beth Simon, Dennis Bouvier, Tzu-Yi Chen, Gary Lewandowski, Robert McCartney, and Kate Sanders. Computer Science Education, 18(2): 117–133, 2008.

Neural networks for predicting the behavior of preconditioned iterative solvers, America Holloway[1] and Tzu-Yi Chen. Proceedings of the 2007 International Conference on Computational Science. Beijing China, May 2007. Also Lecture Notes in Computer Science, 4487: 302–309, 2007.

[1] undergraduate or postbaccalaureate coauthor

Metrics for ranking the performance of supercomputers, Tzu-Yi Chen, Meghan Gunn[1], Beth Simon, Laura Carrington, and Allan Snavely. Cyberinfrastructure Technology Watch, 2(4B): 59–67, November 2006.

An evaluation of the edit-distance-with-moves metric for comparing genetic sequences, Shiri Azenkot[1], Tzu-Yi Chen, and Graham Cormode. DIMACS Technical Report 2005-39, November 2005.

On the existence of nonsymmetric matrices with perfect elimination orderings, Tzu-Yi Chen and Melissa Egan[1]. Proceedings of the Fifth Grace Hopper Celebration of Women in Computing. Chicago IL, October 2004.

Balancing sparse matrices for computing eigenvalues, Tzu-Yi Chen and James Demmel. Linear Algebra and Its Applications, 309: 261–287, April 2000.

SELECTED PROFESSIONAL PRESENTATIONS

Chordal graph based preconditioners for solving sparse linear systems, International Congress on Industrial and Applied Mathematics (ICIAM). Vancouver, BC. 2011.

Leveraging Commonsense Computing, Workshop led by Tammy VanDeGrift, Dennis Bouvier, Tzu-Yi Chen, Robert McCartney, Kate Sanders, and Beth Simon. 2010 Technical Symposium on Computer Science Education (SIGCSE). Milwaukee, WI. 2010.

Graph algorithms for preconditioning sparse linear systems, Algebra/Combinatorics seminar at Pomona College. Claremont, CA. 2007.

On solving sparse linear systems more efficiently, PMaC seminar at the San Diego Supercomputing Center. La Jolla, CA. 2004.

Preconditioners for sparse linear systems, ASCI/CACR seminar at the California Institute of Technology. Pasadena, CA. 2004.

Using graph algorithms to reduce memory usage in scientific computation, Computer Science Colloquium at Harvey Mudd College. Claremont, CA. 2002.

Balancing sparse matrices for computing eigenvalues, NERSC scientific computing seminar at Lawrence Berkeley National Laboratory. Berkeley, CA. 2000.

RESEARCH FUNDING

NSF DUE CCLI Phase-1 Exploratory grant, #DUE-0736738, $24,800 2008–2011
Collaborative research: Commonsense computing: What students know before we teach

NSF Faculty Early Career Development (CAREER) Program grant, #CCF-0446604, $400,000 2005–2011
Preconditioning large, sparse linear systems: theory and practice

COURSES TAUGHT at POMONA COLLEGE

Introduction to Computer Science, Discrete Mathematics, Algorithms, Applied Algorithms, Parallel Computing, Seminar in High Performance Computing, Senior Seminar, Freshman Critical Inquiry Seminar (Living in the Technology Age (Fa04), Facebook, Forgery, and Fairness (Fa08), From Information to Knowledge (Fa11)

Deepak Kumar

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Education

1994	Ph.D.	Computer Science	University at Buffalo, Buffalo, NY
1988	M.S.	Computer Science	University at Buffalo, Buffalo, NY
1983	M.S.	Instrumentation	Birla Institute of Technology & Science, India

Appointments

2004–	Professor	Department of Computer Science, Bryn Mawr College
1995–	Adjunct Faculty	Department of Philosophy, Bryn Mawr College
1993–	Adjunct Faculty	Neural & Behavioral Sciences, Bryn Mawr College
1999–2004	Associate Professor	Department of Math. & Computer Science, Bryn Mawr College
1993–1999	Assistant Professor	Department of Math. & Computer Science, Bryn Mawr College

Recent Professional Activities & Awards

1. Vice Chair of IFIP Working Group 3.2 on Undergraduate Computer Science Education.
2. Member of the ACM Education Council.
3. Member of the Advisory Board, Redesign of the Computer Science AP Course, The College Board.
4. Co-PI on Institute for Personal Robots in Education (IPRE), sponsored by Microsoft Research, Bryn Mawr College, and Georgia Institute of Technology, and NSF DUE CCLI Phase II.
5. Member of Editorial Board of ACM *Transactions on Computing Education (TOCE).*
6. Associate Editor of ACM SIGCSE *Inroads Magazine.*
7. Winner of the NEEDS Premier Courseware Award 2005, with D. Blank, L. Meeden, Holly Yanco.

Five Relevant Publications

1. D. Kumar (editor), "Learning Computing with Robots", *Text for Introductory Computer Science*, Published by IPRE (Institute for Personal Robots in Education), 2009, and 2011.
2. T. Balch, J. Summet, D. Blank, D. Kumar, M. Guzdial, K. O'Hara, D. Walker, M. Sweat, G. Gupta, S. Tansley, J. Jackson, M. Gupta, M. N. Muhammad, S. Prashad, N. Eilbert, A. Gavin, "Designing Personal Robots for Education: Hardware, Software, and Curriculum", In *IEEE Pervasive Computing*, Volume(7), Number(2), April-June 2008.
3. D. Blank, D. Kumar, D. Xu, "Games, Robots, and Robot Games: Complementary Contexts for Introductory Computing Education", *Conference on Game Development in Computer Science Education (GDCSE)*, February-March, 2008.
4. D. Blank, D. Kumar, J. Marshall, L. Meeden, "Bringing Up Robot: Fundamental Mechanisms for Creating a Self-motivated, Self-organizing Architecture", *International Journal of Cybernetics & Systems*, Taylor & Francis 36(2), 2005.

5. with Lisa Meeden: "Trends in Evolutionary Robotics." Book Chapter in *Soft Computing Techniques for Intelligent Robotic Systems*," L. C. Jain and J. Vogel (editors), Springer Verlag, 1998.

Five Additional Publications

1. D. Blank, T. Balch, D. Kumar, K. O'Hara, M. Guzdial, S. Tansley, "Engaging Computing Students with AI and Robotics", *AAAI Spring Symposium on Using AI to Motivate Greater Participation in Computer Science*, AAAI Press, March 2008.

2. D. Blank, D. Kumar, J. Marshall, L. Meeden, "Advanced Robotics Projects for Undergraduate Students", *AAAI Spring Symposium on Robots and Robot Venues: Resources for AI Education*, AAAI Press, March 2007.

3. D. Kumar and J. Turner (editors), "Education for the 21st Century– Impact of ICT and Digital Resources", *Journal of Education and Information Technologies (EAIT)*, 12(3), Springer, 2007.

4. D. Blank, D. Kumar, L. Meeden, H. Yanco, "The Pyro Toolkit for AI Robotics", ***Artificial Intelligence*** *Magazine* 27(1), AAAI Press, 2006.

5. D. Kumar, "The SNePS BDI Architecture" in *The Journal of Decision Support Systems*, Elsevier Science Publishers, Volume 16, pages 3–19, 1996.

Courses Taught (2010-2012)

Introduction to Computing, Computer Organization, Computational Linguistics, Emergence, Algorithms: Design & Practice, Secret Codes (1st year Seminar F2012), Science of Information (F2012)

Collaborators:

Tucker Balch (Georgia Tech.), Douglas Blank (Bryn Mawr College), Ira Greenberg (Southern Methodist University), Mark Guzdial (Georgia Tech.), James Marshall (Sarah Lawrence College), Lisa Meeden (Swarthmore College), Keith O'Hara (Gerogia Tech.) Stuart C. Shapiro (University at Buffalo), Jay Summet (Georgia Tech.), Stewart Tansley (Microsoft Research), Wojciech Szpankowski (Purdue University), Joe Turner (Clemson U.), Mark D. Ward (Purdue University), Dianna Xu (Bryn Mawr College)

Panagiotis Takis Metaxas
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Founder, Program in Media Arts and Sciences
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A. Professional Preparation

EDUCATION: University of Athens, Greece, Mathematics, B.Sc.: 1984
Dartmouth College, Computer Science, MSc.: 1991, Ph.D.: 1992

B. Appointments

2010-today, *Professor*, Department of Computer Science, Wellesley College
2006-2008, 1998-2000 *Department Chair*, Department of Computer Science, Wellesley College
2004-today, *Founder and Co-Director*, Program in Media Arts and Sciences, Wellesley College
1998-2010, *Associate Professor*, Department of Computer Science, Wellesley College
1992-1998, *Assistant Professor*, Department of Computer Science, Wellesley College
1996-1997, *Visiting Scientist*, Department for Computer Science, Sydney University, Australia
1995-1996, *Visiting Scholar*, Laboratory for CS, Massachusetts Institute of Technology
1991-1992, *Research Assistant Professor*, Department of Math and CS, Dartmouth College

C. Publications

Closely Related Publications

1. *From Obscurity to Prominence in Minutes: Political Speech and Real-Time Search* with E. Mustafaraj. In the Proceedings of the Web Science 2010 Conference, Raleigh, NC, April. **Best Paper Prize.**

2. *The use of online videos in the 2008 US congressional elections* with E. Mustafaraj and C. Grevet. In the Proceedings of the SocialComm 2009 Conference, Vancouver, Canada, August.

3. *Sponsored Search for Political Campaigning during the 2008 US Elections* with E. Mustafaraj. SIGIR 2009 -IRA, Boston, July.

4. *Propagation of Distrust,* In the Proceedings of the 2009 International Conference on Internet and Web Applications and Services (ICIW), Venice, May. **Best Paper Award.**

5. *On the Evolution of Search Engine Rankings,* In the Proceedings of the 2009 Web Information Systems and Technologies (WEBIST) Conference, Lisbon, Portugal, March.

6. *The Battle for the 2008 US Congressional Elections on the Web* with Eni Mustafaraj, In the Proceedings of the 2009 Web Science Conference, Athens, Greece. March.

7. P.T. Metaxas and L. Ivanova, "Coverage and Independence: Defining quality in web search results. " *Proc. of 2008 WEBIST*, Madeira, Portugal. **Best Paper Award.**

8. P.T. Metaxas and J. Destafano, "Web Spam, Propaganda and Trust. " *Proc. of Adversarial Information Retrieval on the Web (AIRWeb)*, Chiba, Japan, (2005)

9. L. Graham and P.T. Metaxas, "Of course it is true; I saw it on the internet. Critical Thinking in the internet Era. " *Communications of the ACM*, **46**(5):70–75, (2003)

Other Publications

1. M. Andrews, F.T. Leighton, P.T. Metaxas and L. Zhang, "Automatic Methods for Hiding Latency in Parallel and Distributed Computation", *SIAM Journal of Computing* **(29)**(2):615-647, (1999)

2. D.B. Johnson and P.T. Metaxas "A Parallel Algorithm for Computing Minimum Spanning Trees." *Journal of Algorithms*, **19**:383-410 (1995)

3. P.T. Metaxas, "System and Method for Parallel Error-Diffusion Dithering", *U.S. Patent No. 6,307,978*, Awarded Oct. 23, 2001

4. P.T. Metaxas, "Fast Dithering on a Data-Parallel Computer", *International Conference of Parallel and Distributed Systems* , 1999, pp. 570-576.

5. P.T. Metaxas, G.E. Pantziou and A. Symvonis "A Note on Parallel Algorithms for h-v Drawing of Binary Trees", *Computational Geometry: Theory and Practice* **(9)**, 1998, pp. 145-158.

6. D.B. Johnson and P.T. Metaxas, "Connected Components in $O(\log^{3/2} n)$ Parallel Time for the CREW PRAM", *Journal of Computers and Systems Sciences* **(54)**(2), 1997, pp. 227-242.

D. Synergistic Activities

1. 2000-2002: Chief Technology Officer of OPTAx Sys., Inc. (now BioBehavioral Diagnostics, Inc. – a medical devices company that specializes in computer-enabled tests for measuring the key symptoms of mental disorders. Responsible for development of a research database and turning into product research conducted at Harvard Medical School, McLean Hospital, Dept. of Behavioral Research Psychiatry (DBRP). Since 2007, Research Associate at DBRP.

2. 1998 – today: Member (by honorary invitation) of the Liberal Arts Computer Science Consortium, which produces a "Model Curriculum" used by the majority of College CS departments. Organized the 21st annual LACS meeting in 2004.

3. 1997: Development of "CS215/ARTS215: The Art and Science of Multimedia" award-wining course that has lead to the creation of a new popular major in "Media Arts and Sciences". Experience from this course has been presented at SIGGRAPH and other conferences and have given numerous presentations across the country.

4. 1995, 1997: Organized the 1st and 2nd Fora on Parallel Computing Curricula attended by over 200 faculty members from 9 countries.

Biographical Sketch: Michael W. Sears

(a) Professional Preparation

Rhodes College (Memphis, TN)	Biology, B.S.	1989-1993
University of Pennsylvania (Philadelphia, PA)	Biology, Ph.D.	1995-2001
Indiana State University (Terre Haute, IN)	Bioinformatics, postdoc	2002-2004
University of Nevada, Reno	Physiology, postdoc	2004-2005

(b) Appointments

Assistant Professor, Department of Biology, Bryn Mawr College	7/2009-present
Assistant Professor, Department of Zoology, Southern Illinois University Carbondale	2006-2009
National Science Foundation Postdoctoral Fellow in Biological Informatics	2002-2004
National Science Foundation Graduate Research Trainee	1999-2000

(c) Publications

i. five publications related to ecological modeling

Buckley LB, MC Urban, MJ Angilletta, LG Crozier, LJ Rissler, **MW Sears**. 2010. Can mechanism inform species' distribution models? *Ecology Letters* 13: 1041-1054.

Angilletta, MJ, **MW Sears** & R Pringle (2009) The spatial dynamics of nesting behavior: lizards shift microhabitats to construct nests with beneficial thermal properties. *Ecology* 90:2933-2939.

Lips, KR, J Diffendorfer, JR Mendelson, **MW Sears** (2008) Riding the wave: Reconciling the roles of disease and climate change in amphibian declines. *Public Library of Science Biology* 6:441-454.

Angilletta, MJ, RS Wilson, AC Niehaus, **MW Sears**, CA Navas, PL Ribeiro (2007) Urban physiology: city ants possess high heat tolerance. *Public Library of Science ONE* 2:e258.

Sears, MW (2005) Geographic variation in the life history of the sagebrush lizard: the role of thermal constraints on activity. *Oecologia* 143: 25-36.

ii. five other publications

Sears, MW, JP Hayes, M Banta, D McCormick (2009) Out in the cold: physiological capacity influences behavior in deer mice. *Functional Ecology* 23:744-783.

Wone, B, **MW Sears**, M Labocha, E. Donovan, JP Hayes. (2009) Genetic variances and covariances of metabolic traits in *Mus musculus* and a genetic test of the aerobic capacity model for the evolution of endothermy *Proceedings of the Royal Society of London B* 276: 3695-3704.

Sears, MW, JP Hayes, CS O'Connor, K Geluso, JS Sedinger (2006) Individual variation in thermogenic capacity affects above-ground activity of high altitude deer mice. *Functional Ecology* 20: 97-104.

Sears, MW, MJ Angilletta (2004) Body size clines in *Sceloporus* lizards: proximate mechanisms and demographic constraints. *Integrative and Comparative Biology* 44: 433-442.

Sears MW, MJ Angilletta (2003) Life history variation in the sagebrush lizard (*Sceloporus graciosus*): phenotypic plasticity or local adaptation? *Ecology* 84:1624-1634.

(d) Synergistic activities

Participating faculty member in the Center for the Science of Information, an NSF Science and Technology Center.

Participant in Tri-college (Bryn Mawr, Haverford, and Swarthmore) Working Group on Environmental Studies to create a shared ES concentration.

Member of environmental Studies steering committee at Bryn Mawr College.

Co-organizer of the Quantitative Ninjas at Bryn Mawr College, an online and in person help center for quantitative and computing skills. http://nijas.brynmawr.edu

Organizer of a symposium for the 2011 Annual Meeting of the Society of Integrative and Comparative Biology entitled, "A synthetic approach to the role of thermal adaptation to climate change."

Participant in working group entitled, "Mechanistic distribution models: Energetics, fitness, and population dynamics" 2007-2011. Co-sponsored by the National Center for Ecological Analysis Synthesis (NCEAS) and the National Evolutionary Synthesis Center (NESCent).

Program Officer for the Division of Ecology and Evolution of the Society for Integrative and Comparative Biology. Term from January 2009-January 2012.

Served on Panel for the Biological Informatics Postdoctoral Fellowship Program of the National Science Foundation during 2006, 2008, and 2009.

Participated in Ecosystem Modeling Workshop of the Hovsgol GEF Study Area. Held May 14-24, 2006 at Hustain Nuruu, Mongolia. Sponsored by GEF/World Bank. Goal was to produce a predictive model of the biological and economic effects of climate change in the Lake Hovsgol region in Mongolia.

Participated in a workshop entitled Nomadic Pastoralism and Climate Change in Inner Asia. Held May 25-26, 2006 at Ulaanbaatar, Mongolia. Sponsored by GEF/World Bank. Goal was to produce guidelines for nomadic herder for dealing with the effects of climate change.

(e) Collaborators and other affiliations

i. Collaborators within past 48 months

Michael Angilletta (Indiana State U.), George Bakken (Indiana State U.), Lauren Buckley (U. North Carolina), Lisa Crozier (Northwest Fisheries Science Center), Jay Diffendorfer (United States Geological Survey), Jack Hayes (U. Nevada, Reno), Joe Mendelson (Zoo Atlanta), Karen Lips (U. Maryland), Amanda Niehaus (U. Queensland), Rob Pringle (Stanford U.), Leslie Rissler (U. of Alabama), Mark Urban (U. Connecticut), Robbie Wilson (U. Queensland), Bernard Wone (U. Nevada, Reno)

ii. Graduate Advisors and Postdoctoral Sponsors

PhD Advisor: Arthur Dunham (U. Pennsylvania); PhD Committee: Brenda Casper (U. Pennsylvania), Peter Petraitis (U. Pennsylvania), Jim McNair (Philadelphia Academy of Natural Sciences), Justin Congdon (Savannah River Ecology Lab), Mike O'Connor (Drexel U.); Postdoctoral Sponsors: Jack Hayes (U. Nevada, Reno), George Bakken (Indiana State U.)

iii. Current and Past Undergraduate Research Advisees:

Congwen Wang (Bryn Mawr '13), Madison Schaeffer (Bryn Mawr '11), Monica Stegman (Haverford '10), Evan Raskin (Haverford '10)

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Education

2002	Ph.D.	Computer Science	Johns Hopkins University, Baltimore, MD
1995	M.S.	Computer Science	University of Pittsburgh, Pittsburgh, PA
1993	B.S.	Computer Science	Rutgers College, Rutgers University, New Brunswick, NJ

Appointments

2010–	Department Chair	Department of Computer Science, Swarthmore College
2008–	Associate Professor	Department of Computer Science, Swarthmore College
2002–	Assistant Professor	Department of Computer Science, Swarthmore College

Recent Professional Activities & Awards

1. Area Chair, European Chapter of the Association for Computational Linguistics, 2012
2. Organizer, Eleventh Meeting of the ACL Special Interest Group in Computational Morphology and Phonology, Uppsala, Sweden, 2010
3. Publications Chair, North American Chapter of the Association for Computational Linguistics, 2010
4. Chair, NAACL-HLT 2009 Workshop on Semantic Evaluations, 2009
5. Course development award from Howard Hughes Medical Institute, 2008-2009

Recent and Relevant Publications

1. R. Wicentowski and M. Sydes. "Emotion Detection in Suicide Notes using Maximum Entropy Classification". In *Biomedical Informatics Insights*, Vol. 5 (Suppl. 1), pp. 51–60, 2012.
2. R. Wicentowski, M. Kelly'**10** and R. Lee'**10**. "SWAT: Cross-Lingual Lexical Substitution using Local Context Matching, Bilingual Dictionaries and Machine Translation". In *Proceedings of SemEval-2010: 5th International Workshop on Semantic Evaluations*, 2010.
3. B. Tomasik'**09**, J. Kim'**09**, M. Ladlow'**09**, M. Augat'**09**, D. Tingle'**10**, R. Wicentowski and D. Turnbull. "Using Regression to Combine Data Sources for Semantic Music Discovery". In *Proceedings of the 10th International Society for Music Information Retrieval Conference*, 2009.
4. E. Agirre, L. Màrquez and R. Wicentowski. "Computational semantic analysis of language: SemEval-2007 and beyond". In *Language Resources and Evaluation*, Vol. 43, No. 2, June 2009.
5. R. Wicentowski and M. Sydes. "Using Implicit Information to Identify Smoking Status in Smoke-Blind Medical Discharge Summaries". In *The Journal of the American Medical Informatics Association*, Vol. 15, No. 1, Jan/Feb 2008.
6. R. Wicentowski and T. Newhall. "Using Image Processing Projects to Teach CS1 Topics". In *Proceedings of the 36th SIGCSE Technical Symposium on Computer Science Education*, 2005.

Edited Volumes

1. J. Heinz, L. Cahill and R. Wicentowski, editors. 2010. *Proceedings of the 11th Meeting of ACL Special Interest Group in Computational Morphology and Phonology.* Association for Computational Linguistics, Uppsala, Sweden.

2. E. Agirre, L. Màrquez and R. Wicentowski, editors. 2009. *Proceedings of the Workshop on Semantic Evaluations: Recent Achievements and Future Directions (SEW-2009).* Association for Computational Linguistics, Boulder, Colorado.

3. E. Agirre, L. Màrquez and R. Wicentowski, guest editors. 2009. *Language Resources and Evaluation (formerly Computers and the Humanities).* Vol. 43, No. 2. Springer.

4. E. Agirre, L. Màrquez and R. Wicentowski, editors. 2007. *Proceedings of the Fourth International Workshop on Semantic Evaluations (SemEval-2007).* Association for Computational Linguistics, Prague, Czech Republic.

5. R. Wicentowski and G. Kondrak, editors. 2006. *Proceedings of the Eighth Meeting of the ACL Special Interest Group on Computational Phonology and Morphology at HLT-NAACL 2006.* Association for Computational Linguistics, New York City, USA.

6. J. Goldsmith and R. Wicentowski, editors. 2004. *Proceedings of the Seventh Meeting of the ACL Special Interest Group on Computational Phonology at ACL 2004.* Association for Computational Linguistics, Barcelona, Spain.