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Employment

Indiana University Bloomington

Chair, Department of Informatics (2017–)
Associate Professor, School of Informatics, Computing, and Engineering (2012–)
Adjunct Associate Professor, History and Philosophy of Science

University of Texas Austin

Assistant Professor, School of Information (2011-2012)

University of Pennsylvania

Assistant Professor, History & Sociology of Science (2003-2011)
Undergraduate Chair, Science, Technology, and Society (2005-2011)
Instructor, School of Engineering & Applied Science (2001-2008)

Education

Princeton University

BSE, Civil Engineering & Operations Research, 1994

University of Pennsylvania

PhD, History & Sociology of Science, 2001
MA, History & Sociology of Science, 1998

Research

My research focuses on the social and cultural history of software and software workers and the organizational dynamics of information technology. My first book, *The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (MIT Press, 2013) explores the rise to power of a novel group of technical experts, the computer programmers, systems analysts, and other “whiz kids” who built their careers around the emerging technology of electronic digital computing. I have also written extensively about gender and the computing community, and in particular the often overlooked and misunderstood role of women in computing. I am currently working on a global environmental history of computing tentatively entitled *Dirty Bits: An Environmental History of the Information Age*.

PUBLICATIONS:

- Books** *Computer: A History of the Information Machine*, 3rd edition. With Martin Campbell-Kelly, William Aspray and Jeffrey Yost. (Westview Press, 2013)
- The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise* (MIT Press, 2010)
- Book Chapters** “Making Programming Masculine,” in Tom Misa, ed. *Gender Codes* (Wiley, 2010)
- “Resistance is Futile? Reluctant and Selective Users of the Internet,” in P. Ceruzzi and W. Aspray (eds.) *The Internet and American Business* (MIT Press, 2008). Winner of the Choice Outstanding Academic Title, 2008.
- “Sports Fans and their Information Gathering Habits,” in William Aspray and Barbara Hayes (eds.), *Information and Everyday Life* (MIT Press, 2011). With Jameson Otto and Sara Metz.
- “Computing for the humanities and social sciences,” in W. Aspray and A. Akera (eds.) *Using History To Teach Computer Science and Related Disciplines* (Washington, D.C.: Computing Research Association, 2004)
- “Software as Labor Process,” in *Mapping the History of Computing: Software Issues*, U. Hashagen, R. Keil-Slawik, A. Norberg, eds. (New York: Springer-Verlag, 2002). With William Aspray.
- Articles** “Computing and the Environment: Introducing a Special Issue of Information & Culture”, *Information & Culture* 52:3 (2017), pp. 295-303. With Rebecca Slayton.
- “The Multiple Meaning of the Flowchart,” *Information and Culture* 51:3 (2016), pp. 321-351.
- “Beards, Sandals, and Other Signs of Rugged Individualism: Culture & Identity within the Computing Professions.” *Osiris* 30:1 (2015), pp. 38–65.

“Is Chess the Drosophila of AI? A Social History of an Algorithm.” *Social Studies of Science* 42:1 (2012), pp. 5–30.

Awarded the 2013 Maurice Daumas Prize for the best article on the history of technology published in 2011-2012 from the International Committee for the History of Technology (ICOTECH).

“The Digital Construction of Technology: Rethinking the History of Computers in Society.” *Technology & Culture* 53:4 (2012), pp. 753-776.

“Are those who ignore history doomed to repeat it?” *Chicago Law Review* 78:4 (2012), pp. 1627-1685. With Peter Decherney and Christopher Yoo.

“Letting the ‘Computer Boys’ Take Over: Technology and the Politics of Organizational Transformation,” *International Review of Social History* 48:11 (2003), pp. 152-180.

“The ‘Question of Professionalism’ in the Computing Fields,” *IEEE Annals of the History of Computing* 23:4 (2001), pp. 56-73.

Essays

“Computation, Materiality, and the Global Environment” *IEEE Annals of the History of Computing* 35(3) (2013), pp. 78–80.

“Historical Reflections: Building Castles in the Air,” *Communications of the ACM* 54:4 (2011), pp. 28-30.

“From Computer Celebrities to Historical Biography,” *IEEE Annals of the History of Computing* 33:4, pp. 86-88.

“Software as History Embodied,” *IEEE Annals of the History of Computing* 31:1(2009), pp. 89-91.

“The Computer: Mechanizing the Information Age,” *Oxford Encyclopedia of the Modern World* (Oxford University Press, 2008)

“Computers as Ethical Artifacts,” *IEEE Annals of the History of Computing* 29:4(2007), pp. 95-96.

“Open Source’s Lessons for Historians,” *IEEE Annals of the History of Computing* 26:4(2004), 103-104.

“Power to the people: toward a social history of computing,” *IEEE Annals of the History of Computing* 26:1(2004), pp. 95-96.

“The Development of Computer Languages,” in *Science and its Times: Understanding the Social Significance of Scientific Discovery*, Neil Schlager, ed. (Cambridge, MA: Gale Publishing, 2000)

Reviews

Review of Ronald Kline, *The cybernetics moment, or, why we call our age the information age* (Johns Hopkins, 2015), *Isis*

Review of Gabriella Coleman, *Coding Freedom: The Ethics and Aesthetics of Hacking* (Princeton, 2012), *PoLAR: Political and Legal Anthropology Review*

Review of George Dyson, *Turing’s Cathedral: The Origins of the Digital Universe* (Pantheon, 2011), *Annals of the History of Computing*

Review of Mark Priestley, *A Science of Operations: Machines, Logic and the Invention of Programming* (Springer-Verlag, 2011), *British Journal for the History of Science*

Review of Michael Mahoney, *Histories of Computing* (Harvard University Press, 2011), *Science*

Review of Nils Nilsson, *The Quest for Artificial Intelligence* (Cambridge University Press, 2010), *Isis*

Review of Lars Heide, *Punch-Card Systems and the Early Information Explosion, 1880-1945* (Johns Hopkins University Press, 2009), *Technology & Culture*

Review of Jessica Johnston, *Technological Turf Wars: A Case Study of the Computer Antivirus Industry* (Temple University Press, 2009), *Technology & Culture*

Review of Paul Ceruzzi, *Internet Alley: High Technology in Tysons Corner, 1945-2005* (MIT Press, 2008), *Harvard Business Review*,

Review of J. Storrs Hall, *Beyond AI: Creating the Conscience of the Machine* (Prometheus, 2006), *Isis*

Review of Carroll Pursell, *The machine in America: a social history of technology*, 2nd edition (Johns Hopkins Press, 2007), *Economic History Review*

Review of Joel Shurkin, *Broken genius: the rise and fall of William Shockley, creator of the electronic age* (Macmillan, 2006), *Technol-*

ogy & Culture

Review of Kevin Maney, *The Maverick and His Machine : Thomas Watson, Sr., and the Making of IBM* (J. Wiley & Sons, 2003), *Harvard Business History Review*

Review of Alfred D. Chandler, *Inventing the Electronic Century: The Epic Story of the Consumer Electronics and Computer Industries* (Harvard University Press, 2005), *Technology & Culture*

Review of Thomas Misa, *Leonardo to the Internet: Technology & Culture From the Renaissance to the Present* (Johns Hopkins University Press, 2004), *Historical Studies in the Physical and Biological Sciences*

Review of Ross Bassett, *To the Digital Age: Research Labs, Start-Up Companies, and the Rise of MOS Technology* (Johns Hopkins University Press, 2002), *Isis*

Review of Steven Weber, *The Success of Open Source* (Harvard University Press, 2004), *Technology & Culture*

Review of Douglas Thomas, *Hacker Culture* (University of Minnesota Press, 2002), *IEEE Annals of the History of Computing*

Review of Martin Campbell-Kelly, *From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry* (MIT Press, 2003), *IEEE Annals of the History of Computing*

Review of Alice Burks, *Who Invented The Computer? The Legal Battle That Changed Computing History* (Prometheus Books, 2002) , *American Scientist*

Review of Theiry Bardini, *Bootstrapping: Douglas Englebart, Coevolution, and the Origins of Personal Computing* (Stanford University Press, 2000), *Business History Review*

Review of Raul Rojas and Ulf Hashagen (eds.), *The First Computers: History and Architectures* (Cambridge, MA: MIT Press, 2000), *IEEE Spectrum*

Review of I. Bernard Cohen, *Howard Aiken: Portrait of a Computer Pioneer* (MIT Press, 1999) and I. Bernard Cohen and Gregory W. Welch, eds., *Makin' Numbers: Howard Aiken and the Computer* (MIT Press, 1999), *Business History Review*

CONFERENCES/PRESENTATIONS:

- Invited Talks**
- Society for the History of Technology**, October 2017
Keynote Address, “Technology, Democracy and Participation”
 - Universität Siegen**, July 2017
“Documentation is Work: Flowcharts as Temporal Boundary Objects”
 - USC Digital Humanities Program**, April 2017
”An Environmental History of the Digital Economy”
 - UC Davis**, February 2017
Center for Science and Innovation Studies
“Bitcoin and the Environment”
 - German Historical Institute**, March 2017
“A Social History of the Computer Revolution”
 - Stanford University**, May 2016
“Dirty Bits: The Environmental History of Computing”
 - University of Nevada, Reno**, April 2016
“Dirty Bits: The Environmental History of Computing”
 - Data & Society**, December 2016
Workshop on Eclectic Papers
 - Yale University**, March 2016
“Dirty Bits: The Environmental History of Computing”
 - University of Michigan**, November 2015
“Dirty Bits: The Environmental History of Computing”
 - Special Interest Group Computers, Information and Society**
Keynote address, October 2015
“The Materiality of the Virtual”
 - University of California Los Angeles**, May 2015
“The Manly Art of Programming?”
 - University of Pennsylvania**, March 2015
“Theories of Technological & Organizational Change”

University of California Santa Barbara, January 2015

Lawrence Badash Memorial Lecture in the History of Science

“The Materiality of the Virtual: A Global Environmental History of Computing from Babbage to Bitcoin”

University of Quebec-Montreal, October 2014

Workshop on the Governance of Digital Transformations

“Computers, Decision Technologies, and Strategic IT Management”

Technische Universität München, October 2014

Workshop on Mistakes, Ignorance, Contingency, and Error in Science, Medicine, and Technology

“When Good Software Goes Bad: The Surprising Durability of an Ephemeral Technology”

National Academy of the Sciences, October 2013

“Fifty Years of Computing at the NAS”

Ecole Normale Supérieure, October 2013

Conference on the History and Philosophy of Computing

Keynote address: “The Multiple Meanings of the Flowchart”

University of Pennsylvania, May 2013

“Theories of Technological & Organizational Change”

Institute for Advanced Study, Indiana University, January 2013

“Professionalism & Identity in the Computing Fields”

Rob Kling Center for Social Informatics, October 2012

“From Cosmo Girls to Computer Boys: A Gendered History of the Computer Revolution”

Stanford University, February 2011

“Running Code, Working Women: Rethinking Gender in Computer Science Education”

Philadelphia Area Consortium for the History of Science, October 2010

“Is Chess the *Drosophila* of AI? Computer Games as Experimental Technologies in Artificial Intelligence.”

Lorentz Center, University of Leiden, September 2010

Keynote speaker, *Software History: European Styles*

Wharton School, University of Pennsylvania , April 2010

“Information, Technology, and Organizational Development”

Copenhagen Business School, June 2009

Invited commentator, “IT Shaping Work Processes.”

University of Minnesota, February 2009

“Is Chess the Drosophila of AI? Computer Games as Experimental Technologies in Artificial Intelligence.”

IEEE History Center, August 2009

“Engineering a Professional Identity: The Place of Professional Societies in the History of Computing.”

Wharton School, Executive Program in Work-Learning, August 2008

“The Sociology of Work in Information Technology.”

Drexel University, March 2008

“Cyborgs, Artificial Intelligences, and Meat Machines: Computers and the Reinvention of the Body.”

Soft-EU Conference, Grenoble France, January 2008

“The Software Crisis as a Crisis of Professional Identity.”

University of Wisconsin, February 2007

“Neither Luddites nor Sages: Physicians and Professors as Reluctant Users of the Internet.”

Northwestern University, May 2007

“Why Docs Don’t Do Email: Physicians and Professors as ‘Reluctant’ Users of the Internet.”

Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik, July 2006 “Necessary Intermediaries: Commerce and the Internet in an Historical Perspective.”

Bates Seminar, Penn Nursing History Forum, April 2006

“The Cybernetician visits the Emergency Room: Early Visions of the Hospital as an Information System.”

Fulbright Pre-Academic Program, July 2005

Invited lecture, “Thomas Kuhn and the Structure of Scientific Revolutions.”

Johns Hopkins University, October 2004

“‘The Cosa Nostra of the Data Processing Industry’: Computers, Programmers, and Other Corporate Subversives, 1959-1975.”

Wharton School, University of Pennsylvania, April 2004

“New Power for Management?: The Software Crisis and the Struggle for Organizational Control Over Electronic Computing, 1959-1975.”

Stanford University, February 2003

Center for Work, Technology, and Organizations

“Letting the ‘Computer Boys’ Take Over: Technology and the Politics of Organizational Transformation.”

Penn Economic History Forum, December 2002

“The Computer Revolution in the Corporation.”

Indiana University, December 2002

“Mongolian Horde versus Superprogrammer”: Managers, Programmers, and the Origins of Software Engineering.”

Northwestern University, April 2002

“Information Infrastructure: Technological, Human, and their Intersections.”

University of Wisconsin - Madison, April 2001

“Aristocracy, Democracy, and Systems Design.”

Colby College, January 2001

“The Rise of the U.S. Software Industry, 1946-1980”

Cornell University, December 2000

“From ‘Black Art’ to Industrial Discipline: Towards a Social History of Software Development.”

Conferences

Business History Conference, April 2017

“Software Maintenance as Management Crisis”

The Maintainers, April 2016

“When Good Software Goes Bad: The Historical Significance of Software Maintenance”

Association for Environmental History, May 2015

Bitcoin “Mining” and the Materiality of Digital Goods

Computer Security History Workshop, July 2014

“From Whiz Kids to Cybercriminals: Emerging Narratives of Risk in Computer Security”

Association of Internet Researchers, October 2013

“Latour Revisited: Computers as Inscription Devices in the Digital Laboratory”

Society for the History of Technology, October 2013

“Towards an Environmental History of Computing ”

Society for the History of Technology, October 2012

“From Mechanical Brains to Philosophical Zombies: Lumbering Towards a Computational Model of Mind”

Philadelphia Area Consortium for the History of Science, May 2012

Masculinity in Science, Sciences of Masculinity

Society for the History of Technology, November 2011

Plenary Session: “Cultures & Communities in the History of Computing”

Society for the History of Technology, September 2010

“Materiality and Immateriality in the History of Computing”

Society for the History of Technology, October 2009

“From Computer Operations to Operating Systems: The Hidden Costs of Business Computing.”

Society for the History of Technology, Lisbon, Portugal, October 2008

“Fixing things that can never be broken: Software maintenance as heterogeneous engineering.”

Charles Babbage Institute, Gender and Computing Conference, May 2008

“Making Programming Masculine.”

Society for the History of Technology, October 2006

“Is Chess the Drosophila of AI? Computer Games as Experimental Technologies in Artificial Intelligence.”

Artefacts XI, Nobel Museum, Stockholm, Sweden, September 2006

“A View from the Academy: Teaching the City as Technology.”

Computers in Use: historical and social perspectives, July 2006
Centre for the History of Science, Technology and Medicine, Manchester, UK
“What’s so hard about software? Computers and organizational transformation, 1952-1968.”

Labor and Employment Relations, January 2006
“‘The Cosa Nostra of the Data Processing Industry’: Computers, Programmers, and Other Corporate Subversives, 1959-1975.”

International Association of Word and Image Studies, September 2005
“Wizards, Hackers, and Poets: The Power of Computer Codes and Other Incantations ...”

Using History to Improve Undergraduate Teaching of Computer Science
Computing Research Association, National Science Foundation, August 2001

American Historical Association, January 2001
“Letting Form Follow Function: Using Web-Based Resources for More Than Just an Electronic Syllabus.”

History of Science Society Conference, November 2000 (Vancouver, B.C.)
“Chess Players, Music Lovers, and Mathematicians: Towards a Psychological Profile of the Ideal Computer Scientist.”

Society for the History of Technology Conference, 2000 (Munich)
“From ‘Computer People’ to Software Engineers: The Professionalization of Programming.”

Pacific Northwest Labor History Conference, 2000
“The Software Crisis and the Management of Programmers.”

International Conference on the History of Computing, 2000 (Paderborn, Germany)
“Software as Labor Process.”

American Association of Historians of Medicine Conference, 1999
“America’s Golden Age of Medicine? Exploring the Promise of the World Wide Web for the Teaching of the History of Medicine.”

Society for the History of Technology Conference, 1998

“Building Castles in the Air”: The Software Crisis and the Art of Programming, 1945-1968.”

FELLOWSHIPS AND AWARDS:

Champions of Inclusion Award, M.O.S.A.I.C. (Multicultural Outstanding Achievements in Computing), School of Informatics, Computing, and Engineering (2017)

Indiana University Trustees Teaching Award (2015–16)

Indiana University Institute for Advanced Study Individual Research Grant (2015)

Maurice Daumas Prize (best article), ICOTECH (International Committee for the History of Technology) (2013)

Arthur Norberg Travel Award, Charles Babbage Institute (2013)

Fellow, Rob Kling Center for Social Informatics (2012-)

Penn Humanities Forum/Mellon Fellow (2005–2006)

University of Pennsylvania, Distributed Learning Venture Fund Grant (2001)

Charles Babbage Institute, Tomash Fellowship in the History of Information Processing (2000)

University of Pennsylvania SAS Dissertation Fellowship (2000)

University of Pennsylvania Graduate Fellowship Award (1996-1999)

Nominated for the Dean’s Award for Distinguished Teaching (1998, 2004, 2009)

Princeton University, Class of 1882 Memorial Writing Prize

Lawrence Wotring Academic Merit Scholarship (1990)

National Merit Scholar (1990)

PROFESSIONAL SERVICE:

IEEE Annals of the History of Computing

Editor-in-Chief (2015–present)

Editorial Board (December 2001–present)

IEEE Computer Society History Committee

member (2015–)

Information & Culture: A Journal of History

Advisory Editorial Board (2012-present)

Internet Histories: Digital Technology, Culture & Society

Editorial Board (2016-)

Computer History Museum, CHM Fellows Selection Committee (2012, 2015, 2016)

Hacker Prize Committee, Society for the History of Technology (2009-2011, chair 2012)

Robinson Prize Committee, Society for the History of Technology (2012)

List editor, **H-SCI-MED-TECH** (2005-2011)

Franklin Institute

Advisory Committee, Case Files in the History of Science Project.

National Aeronautics and Space Administration

Review panel (2007)

National Science Foundation

Proposal reviewer, Science and Technology Studies Program

Johns Hopkins University Press

Book manuscript referee.

Business History Review

Served as a referee for articles related to information technology issues.

Technology & Culture

Editor-at-large (2014–present).

Bibliography Committee (2013-2015)

Electronic Media Committee (2014-2015)

Isis

Served as a referee for articles related the history of science.

THESIS ADVISING:

PhD

Richard Knepper, "Shifting Modalities of Use in the XSEDE Project" (Indiana University, 2017)

Dongoh Park, "Digital Nation-Building: Sociotechnical Imaginaries of the Online Identity Infrastructure in Korea" (Indiana University, 2016)

Gerardo Con Diaz, "Intangible Inventions: Patents and the History of Software Development, 1945-1985" (Yale University, 2016)

Roohollah Honarvar, "An Institutional Analysis of the Formation of Jobs in Software Work in the United States, 1945-2001" (London School of Economics, 2015, external examiner)

Peter Collopy, "Videotape: Making a Technology of Politics and Consciousness in the Long 1960s" (University of Pennsylvania, History & Sociology of Science, 2015)

Deanna Day, "Fevers, Fertility, And The Patient Labor Of American Medicine" (University of Pennsylvania, History & Sociology of Science, 2014)

Ksenia Tatarchenko, "'A House with the Window to the West': The Akademgorodok Computer Center (1958-1993)" (Princeton University, History of Science, 2013)

Damon Yarnell, "Behind the Line: Purchasing Agents, Inter-firm Control and the Advent of Mass Production at Ford Motor Company, 1908-1927." (University of Pennsylvania, History & Sociology of Science, 2010)

Corinna Schlombs, "International History of Computing. Technology Transfer between the US and Western Europe." (University of Pennsylvania, History & Sociology of Science, 2010)

Mary Francone, "Participatory Technologies as a Learning Tool: Employee's Perception and Use" (University of Pennsylvania, Wharton School, 2010)

Jennifer Hobbs, "Naming Power: A Historical Analysis of Clinical Information Systems, 1970-1990." (University of Pennsylvania, Nursing History Program, 2008)

MA

Chloe Edwards, "Classification and the Social Transcript" (University of Texas, 2012)

Chris Johnson, "Economic Discourses on Information" (University of Texas, 2012)

Lori Ianelli, "The Social Construction of the Personal Computer" (University of Pennsylvania, 2011)

DeAnna Chung, "Forgetting in the Digital Age" (University of Pennsylvania, 2010)

Jocelyn Cuevas, "Communications Technology and the Filipino Diaspora" (University of Pennsylvania, 2009)

Eian More, "Deviant Behavior in Virtual Communities: Griefing in Second Life" (University of Pennsylvania, 2007)

Renee Ricker, "Electronic Books and the Future of Publishing and Reading" (University of Pennsylvania, 2007)

Dana Saewitz, "Technology, Pessimism, Postmodernism and the Omnipresent iPod" (University of Pennsylvania, 2006)

Senior Thesis

James O'Dwyer, "A Social Analysis of Universal Health Record Initiatives" (Indiana University, 2013)

Alison Mishkin, "Designing Trust: Parents, Children & Web-Based Communities." (University of Pennsylvania, 2010)

Eileen McKeown, "The Role of Information Systems in Fundraising and Advertising for Community Service Organizations." (University of Pennsylvania, 2010)

Anthony Rizzo, "MIMS: How practicing physicians access information to answer clinical questions." (University of Pennsylvania, 2008)

Schuyler Ferguson, "Dynamic Trust Mechanisms in Cyberspace: How do users and systems respond to anonymity online?" (University of Pennsylvania, 2008)

MEDIA APPEARANCES

WFIU, Noon Edition, Panel Discussion, “The Near Future of Artificial Intelligence”, October 2017

Interview, *National Geographic: Original Sin* (documentary series, 2016)

Interview, *Code: Debugging the Gender Gap* (documentary film, 2014)

Consulting producer, *The Computer Boys Take Over* (television series, in development, 2013)

Interview, Radio Österreich, “Women Pioneers in Informatics”, December 2012

Consulting historian, *Top Secret Rosies: The Female ‘Computers’ of WWII* documentary (producer/director LeAnn Erickson), September 2010.

Interview on the social history of computing, Chicago Public Radio, *Odyssey* (hosted by Gretchen Helfrich), July 2005.