



## Henry A. Lieberman

**Research Scientist**  
**MIT Computer Science & Artificial Intelligence Lab**  
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Born 1 March 1952, New York City.

### Employment

2015-Present **Research Scientist**  
**Massachusetts Institute of Technology**  
**Computer Science and Artificial Intelligence Lab**  
**(CSAIL)**

Lieberman is working with Prof. Patrick Winston and Prof. Boris Katz in story understanding, story generation, and the use of Commonsense knowledge and analogical reasoning in cognitive systems.

He is also working on representing point-of-view in machine learning, and making interactive development environments for human-in-the-loop machine learning. He advocates a *mixed-initiative* machine learning approach, where the learning is chosen and guided by real-time interaction with people, rather than just batch-processing of data sets. Explanation and incorporation of user feedback and advice are also crucial.

2015 **Visiting Scientist, MIT Media Laboratory**

2011-2014 **Principal Research Scientist, MIT Media Laboratory**

1987-2011 **Research Scientist, MIT Media Laboratory**

Lieberman's area of interest is in using artificial intelligence and interactive computer graphics techniques to make intelligent interfaces that can help users with their problem solving activities.

As longtime head of the Software Agents Group of the Media Lab, he works on software which can perform interface actions autonomously to satisfy the user's goals, and can learn from interaction with the user.

He uses Common Sense Reasoning to improve interfaces to interactive applications in a wide variety of domains, including digital photography, predictive typing, speech recognition, games, expert systems, information retrieval, and more. Common Sense reasoning, together with advanced natural language processing, is also being explored to enable people to perform programming using natural language rather than a programming language.

He has worked on machine learning applications for detection and prevention of cyberbullying (online harassment of youth on social networks), and on real-time assistance for crisis counseling. These projects were honored with two visits to the White House, and featured on the White House blog both times. He has participated in a real-world deployment on the MTV

youth web site *A Thin Line* and on other social networks.

Among his projects are software agents for the World Wide Web that learn user interests from observing browsing behavior, acting as an "advance scout", continually gathering information and making suggestions.

Another topic is "Programming by Example" interfaces for interactive applications that are capable of learning procedures by demonstrating examples rather than by conventional textual programming. Such interfaces can learn from examples demonstrated on video and annotated graphically by the user. An instructible agent represents recorded procedures using an iconic visual language, can accept advice through voice input, and uses synthesized speech for natural language feedback.

He works on projects showing how color, 3D graphics, animation, and visual presentation principles can benefit knowledge-based programming and debugging, and design of interactive media. He has also worked on applying artificial intelligence to problems in visualization and interactive visual design.

1989-91 **Visiting Professor, University of Paris VI (Sorbonne)  
Pierre and Marie Curie**

Lieberman taught a graduate course "Artificial Intelligence and Human Interface". During this period, his research involved a representation technique, *marcottage*, which brings a "navigational" approach to object-oriented programming. This technique has applications in semantic networks, hypertext, and graphics.

Lieberman is fluent in French. He has taught a university course, delivered keynote speeches at major conferences, and has written technical papers, in French.

1977-1987 **Research Scientist, MIT Artificial Intelligence Laboratory and Laboratory for Computer Science (now CSAIL)**

With Carl Hewitt, he helped develop the actor model of computation, which pioneered the object-oriented approach to programming. He wrote the *Act 1* language, a parallel language for artificial intelligence applications, and a simulator for the *Apiary*, a multiprocessor architecture for object-oriented programming.

In a landmark paper, also with Hewitt, he introduced a new algorithm for garbage collection based on the lifetimes of objects. This led to the acceptance of garbage collection in mainstream computer languages, making possible languages like Java, Python, and C#. He introduced the technique of *delegation* for sharing knowledge between objects, and introduced the notion of prototype-based object-oriented languages.

Lieberman is also a pioneer in the area of Programming by Example (sometimes also called Programming by Demonstration). His 1980 Tinker system was one of the first serious PBE systems, and he subsequently did several other seminal systems. He co-edited the first full book on the topic, and subsequently edited his own book (see the Publications section). This technique is now used in many advanced applications, for example, Microsoft Excel's "Flash Fill" feature.

1980 **Visiting Researcher, Xerox Palo Alto Research Center**

He was invited by Alan Kay to spend a summer visiting the Learning Research Group that developed the Smalltalk system. Worked on programming by example and programming systems for beginning users.

1973-1977 **Research Scientist, Logo Group, MIT Artificial Intelligence Laboratory (now CSAIL)**

His early work was with Seymour Papert's group researching computers and education, the team that developed the educational computer language Logo. Lieberman worked in programming language and computer graphics development, and wrote the first bitmap graphics, the first color graphics, and the first 3D graphics systems for Logo, and a Lisp implementation of Logo. He also taught Logo to high school students. His 1978 SigGraph paper on flood-fill algorithms was the basis of those now used in every modern image-editing program.

## Other professional activities

Teaching Lieberman has extensive experience teaching graduate research seminar courses. He especially enjoys collaborative teaching. Among the courses he has taught at MIT are Commonsense Reasoning for Interactive Applications, Out of Context: A Course on Computer Systems that Adapt to and Learn from Context [with T. Selker], Collaboration between People, Computers and Things [with H. Ishii], Intelligent Agents [with P. Maes], a hands-on AI/Interface Software Workshop [with Hal Abelson], a course in making programming systems for beginning and non-professional users [with M. Resnick] and a Computer Graphics Workshop course [with M. Cooper and R. MacNeil], and a course on Artificial Intelligence and Human Interface at the University of Paris.

He also has taught several one-to-three day tutorials on Intelligent Agents, Programming by Example, and other topics for continuing education of developers and managers in industry. He has presented tutorials at the University of California, Los Angeles; Bentley University; Unicom Seminars in London; AgentLink Summer School [Netherlands], and tutorials at conferences such as the CHI conference [Computers and Human Interface], ACM Conference on Knowledge Capture, and the ACM Intelligent User Interfaces conference.

He has served on thesis committees for many Masters' and Ph.D. thesis students, both at MIT, University of Paris, Columbia, the University of Washington, Saarbrucken University, Germany, and at other universities.

#### Awards and Honors

He was elected to the Executive Council of the AAAI (the Board of Directors of the Association for the Advancement of Artificial Intelligence, the professional society for AI), for a 2012-2015 term. He was appointed to the Oversight Committee for the Intelligent User Interfaces Conference (IUI) by the ACM (Association for Computing Machinery, the professional society for Computer Science).

He has been invited to the White House to present his research twice; once for the 2011 White House Conference on Bullying Prevention, and for the 2014 White House Task Force on Prevention of Sexual Assault. Both appearances were mentioned on the White House blog. He was also invited to a 2014 data analysis innovation conference by the US Consumer Financial Protection Bureau.

He has been appointed a Virtual Visiting Fellow by the Knowledge Media Institute, a net-wide research and educational organization based at the Open University in England.

He has received two Best Paper Awards, at the International Conference on Adaptive Hypermedia (AH-02), and the ACM Conference on Intelligent User Interfaces (IUI-03). See references.

He is listed in *Who's Who in America*, Marquis, 2009.

#### Sponsored research

The MIT Media Lab operates primarily with a "consortium" funding model, where sponsors pay a flat membership fee to the Lab, rather than funding individual projects or researchers. At the time of this writing, there are about 70 sponsors, 80% from industry. See the "Sponsors" section of the Media Lab website.

The Media Lab does also accept “directed” research, or “unrestricted gift” grants to particular researchers for specific projects. Generally, the combination of the consortium allocation and directed research groups has supported Lieberman’s research group of 2-3 PhD students, postdocs/staff, and/or 2-3 MS students and a few temporary undergraduate students.

Among Lieberman’s direct sponsors have been Alenia, Apple Computer, British Telecom, the European Union, Hewlett-Packard, Google, Huawei, IBM, Kansa, Kodak, The Mind-Machine Project, Microsoft, Samsung, Simons Foundation for the Social Brain, Systems Development Foundation, the US Air Force Office of Scientific Research, the US Defense Advanced Research Projects Agency, the US National Science Foundation, the US Office of Naval Research, and Xerox.

Lectures Lieberman has delivered invited lectures on his research at conferences and at many major academic and industrial research centers throughout the USA, Europe and the Far East. A complete list is available upon request.

He has delivered invited keynote speeches at:

- International AI Industry Summit – China Optics Valley, Wuhan, China, November 2016.
- International Conference on Agents and Artificial Intelligence, (ICAART), Angers, France, March 2014.
- IT Convergence International Workshop on Future Mobile Services and Software Technology, Korea Institute of Advanced Science & Technology, Daejeon, Korea, December 2011.
- CAAD Futures (Computer-Aided Architectural Design), Liège, Belgium, 2011.
- Help Me Help You: Bridging the Gaps in Human-Agent Collaboration, AAI 2011 Spring Symposium
- Workshop on Collaboratively Developed AI Resources, Conference of the Association for the Advancement of Artificial Intelligence (AAAI-10), 2010,
- First Malaysian Conference on Artificial Intelligence, 2009.
-

Conference on Information Technology in Asia (CITA-09),

- International Conference on Knowledge Management,
- Association for the Advancement of Artificial Intelligence Spring Symposium and Fall Symposia, 2007.
- IEEE/ACM Conference on Web Intelligence and Intelligent Agent Technology, 2005
- Conference on Computer Aided Design of User Interfaces (CADUI),
- Usability Professionals Association (UPA), 2005.
- AAAI Symposium on Knowledge Collection from Volunteer Contributors, 2005.
- Brazilian National Human-Computer Interaction Conference, 2004.
- Interaction 2004 (Japanese National Human-Computer Interaction Conference),
- Interface Homme-Machine (French National Human-Computer Interaction Conference, presented in French), 2002.

Conferences and Journals

He has also has served as conference chair and program committee member for major international conferences, (PC member unless otherwise indicated), including

- Associate Editor, ACM Transactions on Interactive Intelligence Systems (ACM TiiS), 2011-Present
- co-Chair, Workshop on Scalable Integration of Analytics and Visualization, AAAI 2011 Conference
- International Conference on Entertainment Computing, 2011.
- International Conference on Affective Computing and Intelligent Interaction, (ACII), 2011.
- ACM International Conference on Design of Communication (SigDOC), 2010.
- Program Chair, ACM International Conference on Intelligent User Interfaces, (IUI) 2008 and 2000
- Associate Chair, IFIP Conference on Human-Computer Interaction (INTERACT) 2011
- User Modeling, Adaptation & Personalization (UMAP), 2010, 2011.
- ACM International Conference on Intelligent User Interfaces (IUI), Program Committee member, 2000-present



- International Lisp Conference, 2007, 2009.
- Knowledge Capture (KCap), 2009.
- IFIP Conference on Human-Computer Interaction (INTERACT), 2005, 2007, 2009.
- Conference in Computational Linguistics & Intelligent Text Processing (CicLing), 2009.
- Affective Computing & Intelligent Interaction (ACII) 2007, 2009.
- American Association for Artificial Intelligence (AAAI) Special Track on AI and the Web, 2008
- Advanced Visual Interfaces (AVI) 2006
- Adaptive Hypermedia (AH) 2006
- Co-Chair, AAAI Symposium on Knowledge Collection from Volunteer Contributors (KVCV-05)
- Associate Papers Chair, ACM Conference on Computer-Human Interface [CHI-2001, CHI-2005]
- Symposium on Modeling and Using Context (Context-05)
- Program Chair for IEEE Symposium on End-User Programming, 2001. Program Committee, 2002, 2003.
- Program Chair for ACM Intelligent User Interfaces Conference 2000
- International Conference on Autonomous Agents [2000, 2001]
- Conference on Agents for Business Automation, 2002.
- World Wide Web Conference, 1999, 2000
- Autonomous Agents and Multi-Agent Systems, 2001, 2002, 2003
- The object-oriented programming conferences OOPSLA (USA) and ECOOP (European)
- IEEE Symposium on Visual Languages
- Co-Chair, Workshop on AI and the Environment at the International Joint Conference on Artificial Intelligence 1995.
- Workshop on Machine Learning and Human Computer Interaction, at the International Conference on Machine Learning, 1996.

He has also served on the editorial boards of the journals

- *Journal of Autonomous Agents and Multi-Agent Systems* [Kluwer]
- *Knowledge Based Systems* [Elsevier]
- *New Generation Computing* [Springer/Ohmsha]
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- *Journal of Interactive Media in Education* [Open University, UK]
- *Communication, Computers and Artificial Intelligence* [University of Ghent, Belgium].

## Consulting and Entrepreneurship

Lieberman has consulted on a number of projects in the computer industry. He has worked as a consultant to Storysense Computing (acquired by Dianhuabang), Demeterr (acquired by Google and became Google Hire), Clear Methods, Praxis, Knightsbridge Castle, Kodak, US Interactive, DolphinSearch, Ranstaad and IBM.

He was a consultant to Apple's Advanced Technology Group from 1995 to 1998. He was working with Jim Miller and Bonnie Nardi in a team charged with implementing Apple's *Knowledge Navigator* vision (eventually realized as Siri). He designed an end-user Programming by Example interface for Apple's Data Detectors software, which automatically took actions upon recognizing text patterns such as phone numbers. It was slated to be incorporated into the Mac OS, until Steve Jobs' return to Apple resulted in the demise of Apple's entire Advanced Technology Group research effort.

Together with Christopher Fry, he initiated development of Macintosh Common Lisp at Coral Software, a startup later acquired by Apple Computer, then spun off as DigiTool. The product was widely considered as among the best AI development environments available. A descendent implementation continues as Clozure Common Lisp. He also worked with Fry on the startups Powerscout and Clear Methods.

During 1984-87 he was a consultant to the Atari Cambridge Research Lab, founded by Alan Kay, under the direction of educational pioneer Cynthia Solomon.

He also consulted in evaluating user interface submissions for the Open Systems Foundation in the process that led to the adoption of Motif.

- Patents      Lieberman is primary inventor on three US Patents:
- #5,864,789 "System and Method for Generating Pattern Recognizing Computer Structures from Example Text"
  - #6,353,822 "Method and Apparatus for Document Browsing Based on Real-time Analysis of User Preferences".
  - #7,028,253 "Agent for Integrated Annotation and Retrieval of Images"

He is frequently tapped to be an expert witness and consultant in multimillion-dollar intellectual property cases. He has worked for attorneys Erise IP; Baker Botts; Kirkland and Ellis; O'Melveny & Myers; Kenyon & Kenyon; Finnegan, Henderson, Farabow, Garrett & Dunner; Adiscov; Shore, Chan; Cesari & McKenna; Torti Flanagan; and McDermott, Will & Emery.

Computer art and music      Lieberman also has had a long-standing interest in computer applications to the visual arts and music. His pieces have appeared twice the SigGraph Conference Computer Art Show, at galleries, and performance events, and he was a winner in Byte Magazine's first Computer Art Contest. His art has appeared on record and book covers, and in advertising. He has also written product reviews for the Computer Music Journal.

**Education**

*Habilitation à Diriger des Recherches en Informatique*

Ph.D. equivalent

**University of Paris VI (Sorbonne) Pierre and Marie Curie, 1990.**

The *Habilitation à Diriger des Recherches*, (the name means "Authorization to Direct Research Projects") like the American Ph.D., is the highest diploma awarded by a French university. *Informatique* is "Computer Science". The *Habilitation* is a more advanced degree than the French degree called *Doctorat*. A normal academic career path in France is to obtain the *Doctorat*, work as *Maître de Conférences* (Assistant Professor) for a "tenure-track" period, then obtain the

*Habilitation* as qualification for becoming a full Professor.

Thesis supervisor was Jean-François Perrot [U. Paris 6], and the committee included professors Patrick Purcell [MIT/Imperial College], Pierre Cointe [U. Paris 6], Harald Wertz [U. Paris 8], Jean Bézivin [U. Nantes], Luc Steels [Free U. Brussels].

Project title (translated from the French): *Marcottage: A Navigational Approach to Object-Oriented Programming*.

Bachelor of Science

**Massachusetts Institute of Technology**

B.S. in Mathematics, 1975  
Grade point average, 4.5 out of 5.0  
Awarded Robert J. Seid Mathematics Scholarship

As an undergraduate, he was hired to work in research projects at the MIT Artificial Intelligence Laboratory and the MIT Center for Space Research.

## **Publications**

(This is a partial list, in approximate reverse chronological order)

Lieberman is the 1,390<sup>th</sup> most frequently cited author in Computer Science, (according to Citeseer).

He has an *h-number* (measure of citation impact) of **52** (according to Google Scholar, December 2016). Wikipedia says an h-number of **45** is “equivalent to a member of the National Academy of Sciences”).

Williams, Lieberman,  
Winston 17

**Understanding Stories with Large-Scale Commonsense**, Bryan Williams, Henry Lieberman, and Patrick Winston, Thirteenth International Symposium on Commonsense Reasoning, London, November 2017

Fry and Lieberman 17

***Why Can't We All Just Get Along?: How Science Can Enable A More Cooperative Future***, Christopher Fry and Henry Lieberman, self-published book, 2017.

- Forbus, Kuipers  
Lieberman, 16      **Remembering Marvin Minsky**, *AI Magazine*, Volume 37, Number 3, pp. 94-98, Association for the Advancement of Artificial Intelligence (AAAI), Fall 2016.
- Dinakar, et al 15      **Commonsense Reasoning for Detection, Prevention and Mitigation of Cyberbullying**, Karthik Dinakar, Birago Jones, Catherine Havasi, Henry Lieberman, Rosalind Picard, Invited Journal Track presentation, International Joint Conference on Artificial Intelligence (IJCAI-15), Buenos Aires, Argentina, July 2015. See [Dinakar et al. 12a]
- Dinakar, Chen,  
Picard, Lieberman,  
Filbin 15      **Mixed-Initiative Real-Time Topic Modeling and Visualization for Crisis Counseling**, Karthik Dinakar, Jackie (Ge) Chen, Rosalind Picard, Henry Lieberman, Robert Filbin, ACM Conference on Intelligent User Interfaces (IUI-15), Atlanta, GA, March 2015.
- Lieberman, Henke 15      **Visualizing Inference**, Henry Lieberman and Joseph Henke, Conference of the Association for the Advancement of Artificial Intelligence (AAAI-15) Demo Track, Austin, TX, January 2015.
- Lieberman, Fry 15a      **Understanding the Limits to Competitive Processes**, Henry Lieberman and Christopher Fry, First Workshop on Computing within Limits, Irvine, CA, June 2015.
- Fry, Lieberman 15b      **The Limits to Paradise**, Christopher Fry, Henry Lieberman, First Workshop on Computing within Limits, Irvine, CA, June 2015.
- Dinakar, Chaney,  
Lieberman, Blei 14      **Real-time Topic Models for Crisis Counseling**, Karthik Dinakar, Allison Chaney, Henry Lieberman, David Blei, Workshop on Data Science for Social Change, Int'l Conference on Knowledge Discovery from Data (KDD-14), New York, NY, USA, July 2014.
- Dinakar, Weinstein,  
Lieberman, Selman  
14      **Stacked Generalization Learning to Analyze Teenage Distress**, Karthik Dinakar, Emily Weinstein, Henry Lieberman, Robert Selman, AAAI International Conference on Weblogs and Social Media (ICWSM-14), Ann Arbor, MI, USA, June 2014.

- Chang, Mota,  
Lieberman 14      **GestureNet: A CommonSense Approach to Physical Activity Similarity**, Angela Chang, Selene Mota, Henry Lieberman, Conference on Electronic Visualization and the Arts, London, July 2014.
- Lieberman 14      **The New Era of High-Functionality Interfaces**, Int'l. Conference on Agents and Artificial Intelligence (ICAART-14), Keynote Presentation, Angers, France, March 2014. Springer Lecture Notes in Computer Science.
- Lieberman,  
Rosenzweig, Fry 14      **Steptorials: Mixed-Initiative Learning of High Functionality Applications**, Henry Lieberman, Elizabeth Rosenzweig, Christopher Fry, ACM Conference on Intelligent User Interfaces, Haifa, Israel, February 2014.
- Howard and  
Lieberman 14      **BrainSpace: Relating Neuroscience to Knowledge About Everyday Life**, Newton Howard and Henry Lieberman, *Cognitive Computation* journal, Vol. 6, pp.35–44 Springer, 2014.
- Smith and Lieberman  
13c      **Interpreting Vague and Ambiguous Referring Expressions by Dynamically Binding to Properties of the Context Set**, Dustin Smith and Henry Lieberman, 8<sup>th</sup> International Interdisciplinary Conference on Modeling and Using Context (Context-13), Annecy, France, October 2013.
- Smith and Lieberman  
13a      **Generating and Interpreting Referring Expressions as Belief State Planning and Plan Recognition**, Dustin Smith and Henry Lieberman, European Workshop on Natural Language Generation, Sofia, Bulgaria, August 2013.
- Smith and Lieberman  
13b      **Using Plan Recognition for Generating and Interpreting Referring Expressions**, Dustin Smith and Henry Lieberman, AAAI Workshop on Plan, Activity and Intent Recognition, Seattle, July 2013.
- Fry and Lieberman 13      **Decision-Making Should Be More Like Programming**, Christopher Fry and Henry Lieberman, International Symposium on End-User Development, Copenhagen, June 2013.

- Lieberman, Dinakar, Jones 13 **Crowdsourced Ethics with Personalized Story Matching**, Henry Lieberman, Karthik Dinakar, Birago Jones, ACM Conference on Computers and Human Interaction (CHI-13), Paris, France, April/May, 2013
- Macbeth et al 13a **Script-Based Story Matching for Cyberbullying Prevention**, Jamie Macbeth, Hanna Adeyema, Henry Lieberman, Christopher Fry, ACM Conference on Computers and Human Interaction (CHI-13), Paris, France, April/May, 2013
- Sayan et al 13 **Script-Based Story Matching to Encourage Empathy for Social Change**, Sila Sayan, Carlo Mannino, Jamie Macbeth, Hanna Adeyema, Henry Lieberman, Christopher Fry, Workshop on Designing Social Media for Change, CHI 2013, Paris, France, April, 2013.
- Lieberman 12 **Say Hello to Smarter Apps That Fulfill Your Wishes**, Henry Lieberman, *Wired UK*, November 2012, p. 70.
- Dinakar et al, 12a **Commonsense Reasoning for Detection, Prevention and Mitigation of Cyberbullying**, Karthik Dinakar, Birago Jones, Catherine Havasi, Henry Lieberman, Rosalind Picard, ACM Transactions on Interactive Intelligent Systems (TiiS), Volume 2, Number 3, 2012.
- Dinakar, et al 12b **You Too?! Mixed-Initiative LDA Story Matching to Help Teens in Distress**, Karthik Dinakar, Birago Jones, Henry Lieberman, Rosalind Picard, Carolyn Rose, Matthew Thoman, Roi Reichart, International Conference on Weblogs and Social Media (ICWSM-12), Dublin, Ireland, June 2012.
- Chang et al. 12 **Textual Tinkerability: Encouraging Storytelling Behaviors to Foster Emergent Literacy**, Angela Chang, Cynthia Breazeal, Tom Roberts, Glorianna Davenport, Henry Lieberman, Nick Montfort, Computers and Human Interaction Conference (CHI-12), Austin, TX, May 2012.
- Lieberman, Dinakar, Jones 11 **Let's Gang Up on Cyberbullying**, Henry Lieberman, Karthik Dinakar, Birago Jones, *IEEE Computer Magazine*, Institute of Electrical and Electronic Engineers, Volume 44, Number 9, Sept. 2011.

- Dinakar, Reichart,  
Lieberman, Jones 11 **Modeling the Detection of Textual Cyberbullying**, Karthik Dinakar, Roi Reichart, Henry Lieberman, Birago Jones, Workshop on the Social Mobile Web, International AAAI Conference on Weblogs and Social Media, Barcelona, Catalonia, Spain, July 2011.
- Chi and Lieberman  
11a **Raconteur: Integrating Authored and Real-Time Social Media**, Pei-Yu (Peggy) Chi and Henry Lieberman, ACM Conference on Computers and Human Interaction (CHI-11), Vancouver, May 2011.
- Ko, et. al 11 **The State of the Art in End-User Software Engineering**, Andrew Ko, Abraham R., Beckwith L., Blackwell A., Burnett M.M., Erwig M., Scaffidi C., Lawrence J., Lieberman H., Myers B.A., Rosson M.B., Rothermel G., Shaw M. and Wiedenbeck S., ACM Computing Surveys, Vol .43, Number 3, Article 21, (April 2011), 44 pages.
- Chi and Lieberman  
11b **Intelligent Assistance for Conversational Storytelling Using Story Patterns**, Pei-Yu (Peggy) Chi and Henry Lieberman, ACM International Conference on Intelligent User Interfaces, Palo Alto, CA, February 2011.
- Arnold and  
Lieberman 10c **Cross-Domain Scruffy Inference**, Kenneth Arnold and Henry Lieberman, Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium on Commonsense Knowledge, Arlington, VA, USA, November 2010.
- Arnold and  
Lieberman 10b **Embracing Ambiguity**, Kenneth Arnold and Henry Lieberman, ACM SigSoft Workshop on the Future of Software Engineering Research, Santa Fe, NM, USA, November 2010.
- Krishnamurthy and  
Lieberman 10 **CrossBridge: Finding Analogies Using Dimensionality Reduction**, Jayant Krishnamurthy and Henry Lieberman, Association for the Advancement of Artificial Intelligence (AAAI) Fall Symposium on Commonsense Knowledge, Arlington, VA, USA, November 2010.
- Arnold and  
Lieberman 10a **Managing Ambiguity in Programming by Finding Unambiguous Examples**, Kenneth Arnold and Henry Lieberman, ACM Onward Conference (part of ACM



Systems, Programming, Languages, and Applications: Software for Humanity, formerly OOPSLA), Reno, Nevada, USA, October 2010

- Chang, et. al. 10 **Lessons Learned from Designing Children's Interactive Narratives**, Angela Chang, Pei-Yu Chi, Nick Montfort, Cynthia Breazeal, and Henry Lieberman, Conference of the Electronic Literature Organization (ELO), Providence, RI, USA, June 2010.
- Speer, et. al. 10a **Finding Your Way in a Multi-dimensional Semantic Space with Luminoso**, Robert Speer, Catherine Havasi, Nichole Treadway, and Henry Lieberman, ACM International Conference on Intelligent User Interfaces (IUI), Hong Kong, China, February 2010, pp. 385-388.
- Chi and Lieberman 10 **Raconteur: From Intent to Stories**. Pei-Yu (Peggy) Chi and Henry Lieberman, In Proceeding of the 14th international Conference on intelligent User interfaces (Hong Kong, China, February 07 - 10, 2010). IUI '10. ACM, New York, NY, 301-304.
- Smith and Lieberman 10 **The Why UI: Using Goal Networks to Improve User Interfaces**. Dustin Smith and Henry Lieberman, In Proceeding of the 14th international Conference on Intelligent User Interfaces, Hong Kong, China, February 2010. IUI '10. ACM, New York, NY, 377-380.
- Speer, et. al. 10b **Visualizing Common Sense Connections with Luminoso**, Robert Speer, Catherine Havasi, Nichole Treadway, Henry Lieberman, International Workshop on Intelligent Visual Interfaces for Text Analysis (IVITA-10), 2010.
- Faaborg and Lieberman 10 **A Goal-Oriented Web Browser**, Alexander Faaborg and Henry Lieberman, in *No Code Required: Giving Users Tools to Transform the Web*, Morgan Kaufmann, 2010, pp. 65-84.
- Lieberman and Ahmad 10 **Knowing What You're Talking About: Natural Language Programming of a Multi-Player Online Game**, Henry Lieberman and Moin Ahmad, in *No Code Required: Giving Users Tools to Transform the Web*, Morgan Kaufmann, 2010, pp. 331-346.

- Lieberman 09      **User Interface Goals, AI Opportunities**, Henry Lieberman, *AI Magazine*, Volume 30, Number 4, Association for the Advancement of Artificial Intelligence (AAAI). Special Issue on Usability of AI Systems, Winter 2009-2010, pp. 16-23.
- Smith and Lieberman 09      **Recognizing and Using Goals in Event Management**, Dustin Arthur Smith, Henry Lieberman, ACM Conference on Computer-Human Interaction, (CHI-09), Boston, April 2009. Pages 4525-4530
- Villalon, Lieberman, Sass 09      **Breaking Down Brick Walls: Design, Construction, and Prototype Fabrication Knowledge in Architecture**, Rachele Villalon, Henry Lieberman, Larry Sass, ACM Conference on Computer-Human Interaction, (CHI-09), Boston, April 2009. pp. 4261-4266.
- Havasi, Pustejovsky, Speer, Lieberman 09      **Digital Intuition: Applying Common Sense Using Dimensionality Reduction**, Catherine Havasi, James Pustejovsky, Robert Speer, and Henry Lieberman, *IEEE Intelligent Systems* 24(4), Special Issue on Human-Level Intelligence, pp. 24-35, July 2009.
- Alonso, Havasi, Lieberman 09      **PerspectiveSpace: Opinion Modeling with Dimensionality Reduction**, Jason Alonso, Catherine Havasi, and Henry Lieberman, Conference on User Modeling, Adaptation, and Personalization (UMAP-09), Trento, Italy, June 2009.
- Shen, Lieberman, Davenport 09      **What's Next: Emergent Storytelling in Video Collections**, Edward Shen, Henry Lieberman and Glorianna Davenport, ACM Conference on Computers and Human Interaction (CHI-09), Boston, April 2009.
- Lieberman and Ahmad 09      **Knowing What You're Talking About: Natural Language Programming of a Multi-Player Online Game**, Henry Lieberman and Moin Ahmad, Workshop on End-User Programming for the Web, ACM Conference on Computers and Human Interaction (CHI-09), Boston, April 2009.
- Faaborg and Lieberman 10      **A Goal-Oriented Web Browser**. Alex Faaborg and Henry Lieberman, in *No Code Required: End-User*

*Programming for the Web*, Allen Cypher, Mira Dontcheva, Tessa Lau and Jeff Nichols, eds., Morgan Kaufman, 2010. An earlier version also appears in the ACM Conference on Computers and Human Interaction (CHI-06), Montréal, April 2006.

Moore and  
Lieberman 09

**Talking About Painful Subjects: Flexibility and Constraints in Patient Interviews**, John Moore and Henry Lieberman, in Renata Bushko, ed., *Future of Health Technology: Strategy for the Future*, IOS Press, 2009.

Speer, et. al. 09

**An Interface For Targeted Collection Of Common Sense Knowledge Using a Mixture Model**, Robert Speer, Jayant Krishnamurthy, Catherine Havasi, Dustin Smith, Henry Lieberman, Kenneth Arnold, International Conference on Intelligent User Interfaces, Sanibel, FL, February 2009.

Havasi and  
Lieberman 09

**Story Understanding and Generation For Aware and Interactive Interface Design**, Catherine Havasi and Henry Lieberman, eds., Workshop at ACM International Conference on Intelligent User Interfaces (IUI-09), Sanibel, FL, February 2009.

Speer, Havasi,  
Lieberman 08

**AnalogySpace: Reducing the Dimensionality of Commonsense Knowledge**, Robert Speer, Catherine Havasi, and Henry Lieberman, Conference of the Association for the Advancement of Artificial Intelligence (AAAI-08), Chicago, July 2008.

Kim, Lieberman,  
Picard 08

**Common Sense Assistant for Writing Stories that Teach Social Skills**, Kyunghye Kim, Henry Lieberman, and Rosalind Picard, ACM Conference on Computers and Human Interaction (CHI-08), Florence, Italy, April 2008.

Lieberman 08

**Usable Artificial Intelligence Needs Common Sense Knowledge**, Henry Lieberman, Workshop on Usable Artificial Intelligence, ACM Conference on Computers and Human Interaction (CHI-08), Florence, Italy, April 2008.

Lieberman 07a

**Back into Equilibrium: Balancing the Ordinary and the Extraordinary**, Henry Lieberman, in *Fora d'Equilibri*

(*Out of Balance: New Frontiers in Science, Art and Thought*), Department of Culture of Catalonia, and Fundació Caixa Catalunya, Barcelona, Catalonia, Spain, September 2007.

- Lieberman 07b **From Whole Earth to the Whole Web** (book review of Fred Turner's "From Counterculture to Cyberculture"), Henry Lieberman, *Science Magazine*, American Association for the Advancement of Science, March 2007.
- Chung, Lieberman 07 **GlobalMind: Automated Analysis of Cultural Contexts with Multicultural Common-Sense Computing**, Hyemin Chung and Henry Lieberman, *International Journal on Semantic Web and Information Systems*, Special Issue on Semantics of People and Culture, 2007. Reprinted in *Selected Readings on Global Information Technology: Contemporary Applications*, Hakikur Rahman, ed., IGI Global Publishers, 2008.
- Shen, Lieberman, Lam 07 **What Am I Gonna Wear: Scenario-Oriented Recommendation**, Edward Shen, Henry Lieberman, and Francis Lam. *International Conference on Intelligent User Interfaces (IUI-07)*, Honolulu, January 2007.
- Lieberman, Smith Teeters 07 **Common Consensus: A Web-based Game for Collecting Commonsense Goals**, Henry Lieberman, Dustin Smith, Alea Teeters, *Workshop on Common Sense for Intelligent Interfaces*, ACM International Conference on Intelligent User Interfaces (IUI-07), Honolulu, January 2007.
- Carvalho et al. 07 **Using Common Sense for Planning Learning Activities**, Aparecido Fabiano Pinatti de Carvalho, Junia Coutinho Anacleto, Henry Lieberman, Muriel de Souza Godoi, Silvia Zem-Mascarenhas, *Workshop on Common Sense for Intelligent Interfaces*, ACM International Conference on Intelligent User Interfaces (IUI-07), Honolulu, January 2007.
- Lieberman 07c **A Creative Programming Environment**, Henry Lieberman, in *HCI Remixed*, Tom Ericson and David MacDonald, eds., MIT Press, 2007.

- Lieberman and Chu 07 **An Interface for Mutual Disambiguation of Recognition Errors in a Multimodal Navigational Assistant**, Henry Lieberman and Amy Chu, *Multimedia Systems Journal*, Special Issue on User-Centered Multimedia, Vol. 12, Nos. 4-5, pp. 393-402, Summer 2007.
- Lieberman and Espinosa 07 **A Goal-Oriented Interface To Consumer Electronics Using Planning And Commonsense Reasoning**, Henry Lieberman and José Espinosa, *Knowledge-Based Systems Journal*, Vol 20, pp. 592-606, January 2007.
- Anacleto et al 06 **Applying Common Sense to Distance Learning: the Case of Home Care Education**, Junia Anacleto, Aparecido de Carvalho, Vania Almeida, Muriel de Souza Godoi, Silvia Zem-Mascarenhas, Henry Lieberman, Americo Talarico Neto, Brazilian Conference on Human-Computer Interaction (IHC-06), Natal, Brazil, November 2006. 21
- Gouldstone, Liu, Lieberman, Ishii 06 **Saurus: An Emotionally Weighted Thesaurus**, Jim Gouldstone, Hugo Liu, Henry Lieberman, and Hiroshi Ishii, in *Computational Aesthetics: Artificial Intelligence Approaches to Beauty and Happiness*, AAAI-06 Workshop, Boston, July 2006.
- Lieberman 06 **The Continuing Quest for Abstraction**, European Conference on Object-Oriented Programming (ECOOP-06), 20<sup>th</sup> Anniversary Panel: The Past and Future of Object-Oriented Programming, Nantes, France, July 2006.
- Teng, Shen, Lieberman, Maes 06 **Your Memory, Connected**, Henry Lieberman, James Teng, Edward Shen, Pattie Maes, SigGraph Art Show, Boston, MA, July 2006.
- Anacleto, Lieberman, Tsutsumi, Neris, Carvalho, Espinosa, Zem 06 **Can Common Sense Uncover Cultural Differences in Computer Applications?** Junia Anacleto, Henry Lieberman, Marie Tsutsumi, Vânia Neris, Aparecido Carvalho, Jose Espinosa and Silvia Zem-Mascarenhas), IFIP World Computer Conference, Santiago, Chile, August 2006.
- Faaborg and Lieberman 06

- A Goal-Oriented Web Browser.** Alex Faaborg and Henry Lieberman, ACM Conference on Computers and Human Interaction (CHI-06), Montréal, April 2006.
- Mihalcea, Liu, and Lieberman 06 **NLP (Natural Language Processing) for NLP (Natural Language Programming),** Rada Mihalcea, Hugo Liu and Henry Lieberman, International Conference on Computational Linguistics and Intelligent Text Processing, Mexico City, Springer Lecture Notes in Computer Science, February 2006.
- Lieberman and Espinosa 06 **A Goal-Based Interface to Consumer Electronics,** Henry Lieberman and José Espinosa, International Conference on Intelligent User Interfaces, Sydney, January 2006.
- Lee, Bonanni, Espinosa, Lieberman, Selker 06 **Augmenting Kitchen Appliances with a Shared Context Using Knowledge about Daily Events.** C-H. Lee, L. Bonnani, J. Espinosa, H. Lieberman, T. Selker, International Conference on Intelligent User Interfaces, Sydney, January 2006.
- Lieberman, Paterno and Wulf, eds. 06 **End-User Development,** (Henry Lieberman, Fabio Paterno and Volker Wulf), Springer Academic Publishers, 2006.
- Espinosa and Lieberman 05 **EventNet: Inferring Temporal Relations Between Commonsense Events,** Henry Lieberman and José Espinosa), Fourth Mexican International Conference on Artificial intelligence, (MICAI-05), Monterrey, Mexico, November 2005.
- Lieberman and Kumar 05 **Providing Expert Advice by Analogy for On-Line Help** Henry Lieberman and Ashwani Kumar, Keynote Presentation, IEEE/ACM Conference on Web Intelligence & Intelligent Agent Technology, Compiègne, France, September 2005.
- Liu and Lieberman 05 **Programmatic Semantics for Natural Language Interfaces,** Hugo Liu and Henry Lieberman, ACM Conference on Computers & Human Interaction (CHI-2005), Portland, OR, April 2005.
- Lieberman and Liu 05 **Feasibility Studies for Programming in Natural Language,** in End-User-Development, Henry Lieberman,

Fabio Paterno and Volker Wulf, eds., Kluwer Academic Publishers, 2005.

- Chung, Kern, and Lieberman 05 **Topic Spotting Common Sense Translation Assistant** Jaewoo Chung, Rachel Kern and Henry Lieberman, ACM Conference on Human-Computer Interaction (CHI-2005), Portland, OR, April 2005.
- Liu and Lieberman 05 **Metafor: Visualizing Stories as Code**, Hugo Liu and Henry Lieberman, ACM Conference on Intelligent User Interfaces (IUI-2005), San Diego, January 2005.
- Lieberman, Faaborg, Daher, Espinosa 05 **How to Wreck a Nice Beach You Sing Calm Incense.** Henry Lieberman, Alexander Faaborg, Waseem Daher, José Espinosa. International Conference on Intelligent User Interfaces, (IUI-2005), January 2005, San Diego.
- Lieberman, Liu, Singh, Barry 04 **Beating Common Sense into Interactive Applications**, Henry Lieberman Hugo Liu, Push Singh, and Barbara Barry), *AI Magazine*, Association for the Advancement of Artificial Intelligence, Winter 2004-2005.
- Lieberman, Faaborg, Espinosa, Stocky 04 **Common Sense on the Go: Giving Mobile Applications an Understanding of Everyday Life**, Henry Lieberman, Alexander Faaborg, José Espinosa, and Tom Stocky, *British Telecom Technology Journal*, Vol. 22, Number 4, October 2004.
- Stocky, Faaborg and Lieberman 04 **A Commonsense Approach to Predictive Text Entry**, Tom Stocky Alexander Faaborg and Henry Lieberman, Conference on Human Factors in Computing Systems (CHI 04), Vienna, Austria, April 2004.
- Kumar, Sundararajan, Lieberman 04 **Common Sense Investing: Bridging the Gap Between Expert and Novice**, Ashwani Kumar, Sharad Sundararajan and Henry Lieberman, Conference on Human Factors in Computing Systems (CHI 04), Vienna, Austria, April 2004.
- Wagner and Lieberman 04a **Supporting User Hypotheses in Problem Diagnosis on the Web and Elsewhere**, Earl Wagner and Henry Lieberman, ACM Conference on Intelligent User Interfaces, Funchal, Madeira, Portugal, January 2004.

- Wagner and Lieberman 04b **Personalized Presentation of Policies and Processes**, Earl Wagner and Henry Lieberman in *Designing Personalized User Experiences in eCommerce*, Claire-Marie Karat, Jan Blom, John Karat, eds., Kluwer Academic Publishers, Dordrecht, Netherlands, 2004.
- Wagner and Lieberman 04c **Understanding and Debugging System Configurations**, Earl Wagner and Henry Lieberman, Conference on the Human Impact and Application of Autonomic Computer Systems (CHIACS-2), IBM Watson Research Center, Yorktown Heights, New York, April 2004.
- Lieberman and Wagner 03 **Intelligent Interfaces for E-Commerce Problem Solving**, Henry Lieberman and Earl Wagner, ACM Conference on Electronic Commerce, San Diego, June 2003.
- Liu, Selker, Lieberman 03 **Visualizing the Affective Structure of a Text Document**, Hugo Liu, Ted Selker, and Henry Lieberman, Conference on Human Factors in Computing Systems (CHI 03), Ft. Lauderdale, Florida.
- Lieberman and Wagner 03 **End-User Debugging for Electronic Commerce**, Henry Lieberman and Earl Wagner, ACM Conference on Intelligent User Interfaces, Miami Beach, January 2003.
- Liu, Lieberman, Selker 03 **A Model of Textual Affect Sensing using Real-World Knowledge**. Hugo Liu, Henry Lieberman, and Ted Selker, International Conference on Intelligent User Interfaces (IUI 2003). Miami, Florida **Recipient of the Outstanding Paper Award** at this conference.
- Sharon, Lieberman and Selker 03 **A Zero-Input Interface for Leveraging Group Browsing**, Taly Sharon, Henry Lieberman, and Ted Selker, ACM Conference on Intelligent User Interfaces, Miami Beach, January 2003.
- Lieberman, Fry, Plusch 03 **Static and Dynamic Semantics of the Web**, Henry Lieberman, Christopher Fry and Mike Plusch, in *Spinning The Semantic Web*, Dieter Fensel, James Hendler, Henry Lieberman, Wolfgang Walster, eds., MIT Press, 2003.



- Sharon, Lieberman  
and Selker 02      **Searching the Web with a Little Help from Your Friends**, Taly Sharon Henry Lieberman, and Ted Selker, ACM Conference on Computer-Supported Cooperative Work, New Orleans, November 2002.
- Lieberman and Liu 02      **Adaptive Linking between Text and Photos Using Common Sense Reasoning**, Henry Lieberman and Hugo Liu, Conference on Adaptive Hypermedia and Adaptive Web Systems, Malaga, Spain, May 2002.
- Liu and Lieberman 02      **Robust Photo Retrieval Using World Semantics**, Hugo Liu and Henry Lieberman, Proceedings of the 3rd International Conference on Language Resources And Evaluation Workshop: Using Semantics for Information Retrieval and Filtering (LREC2002) -- Canary Islands, Spain
- Liu, Lieberman and  
Selker 02      **GOOSE: A Goal-Oriented Search Engine With Commonsense**, Hugo Liu, Henry Lieberman, and Ted Selker. Conference on Adaptive Hypermedia and Adaptive Web Systems, Malaga, Spain, May 2002. ***This paper won the award for "Best Artificial Intelligence Paper"*** from AEPIA, Asociación Española para la Inteligencia Artificial (Spanish Association for Artificial Intelligence).
- Lieberman 02      **Out of Many, One: Reliable Results from Unreliable Recognition**, Henry Lieberman, ACM Conference on Computers and Human Interaction (CHI-2002), Minneapolis, MN, USA, April 2002.
- Lieberman and  
Mason 02      **Intelligent Agent Software for Medicine**, Henry Lieberman and Cindy Mason, in *Future of Health Technology*, Renata Bushko, ed., IOS Press, Amsterdam, 2002.
- Lieberman and Selker  
02      **Agents for the User Interface**, Henry Lieberman and Ted Selker, in *Handbook of Agent Technology*, Jeffrey Bradshaw, ed., MIT Press, 2002.
- Lieberman 02      **Art Imitates Life: Programming by Example as an Imitation Game**, Henry Lieberman, in *Imitation in Natural and Artificial Systems*, Kirsten Dautenhahn and Christopher Nehaniv, eds., MIT Press, 2002.

- Lieberman, Fry, & Weitzman 01 **Exploring the Web with Reconnaissance Agents**, Henry Lieberman, Christopher Fry and Louis Weitzman, *Communications of the ACM*, August 2001. pp. 69-75.
- Lieberman, Rosenzweig and Singh 01 **An Agent for Integrated Annotation and Retrieval of Images**, Henry Lieberman, Elizabeth Rosenzweig, and Push Singh, *IEEE Computer*, July 2001, pp. 57-61.
- Lieberman, ed. 01 **Your Wish is My Command: Programming by Example** Henry Lieberman, ed., Morgan Kauffman, San Francisco, 2001.
- Shearin and Lieberman 01 **Intelligent Profiling by Example**, Sybil Shearin and Henry Lieberman, *ACM Conference on Intelligent User Interfaces*, Santa Fe, NM, January 2001.
- Lieberman and Fry 01 **Will Software Ever Work?**, Henry Lieberman and Christopher Fry, *Communications of the ACM*, March 2001.
- Lieberman 01 **Interfaces that Give and Take Advice**, Henry Lieberman, in *Human-Computer Interaction for the New Millenium*, John Carroll, ed., ACM Press/Addison-Wesley, pp. 475-485, 2001.
- Lieberman 00 **Programming by Example**, Henry Lieberman, (Introduction and Guest Editor), Special Issue of *Communications of the ACM*, March 2000.
- St. Amant, Lieberman, Potter, Zettlemoyer 00 **Visual Generalization in Programming by Example**, Robert St. Amant, Henry Lieberman, Richard Potter, and Luke Zettlemoyer), *Communications of the ACM*, March 2000. Also in [Lieberman, ed. 01].
- Vivacqua and Lieberman 00 **Agents to Assist in Finding Help**, Adriana Vivacqua and Henry Lieberman, *ACM Conference on Computers and Human Interface (CHI-2000)*, the Hague, Netherlands, April 2000.
- Lieberman and Selker 00 **Out of Context: Computer Systems that Learn About, and Adapt to, Context**, *IBM Systems Journal*, Vol 39, Nos 3&4, pp.617-631, 2000.

- Lieberman, Nardi & Wright 99      **Training Agents to Recognize Text**, Henry Lieberman, Bonnie Nardi and Dave Wright, International Conference on Autonomous Agents [Agents-99], Seattle, May 1999. Also to appear in the *Journal of Autonomous Agents and Multi-Agent Systems*, 2000, and in [Lieberman, ed. 01].
- Lieberman, Van Dyke & Vivacqua, 99      **Let's Browse: A Collaborative Browsing Agent** Henry Lieberman , Neil Van Dyke and Adriana Vivacqua. International Conference on Intelligent User Interfaces, Los Angeles, January 1999. *Knowledge Based Systems Journal*, Vol 12, pp. 427-431, Elsevier, 1999.
- Van Dyke, Lieberman, & Maes 99      **Butterfly: A Conversation-Finding Agent for Internet Relay Chat**, Neil Van Dyke, Henry Lieberman, and Pattie Maes). International Conference on Intelligent User Interfaces, Los Angeles, January 1999.
- Lieberman 99      **Personal Assistants for the Web: an MIT Perspective**, Henry Lieberman, in *Intelligent Information Agents*, Matthias Klusch, ed., Springer-Verlag, 1999.
- Lieberman 99      **Beyond Information Retrieval: Information Agents at the MIT Media Lab**, Henry Lieberman, Kuntsliche Intelligenz [German Journal of Artificial Intelligence], 1999.
- Lieberman 98      **Integrating User Interface Agents with Conventional Applications**, Henry Lieberman, ACM Conference on Intelligent User Interfaces, San Francisco, January 1998. *Knowledge Based Systems Journal*, Vol. 11, No. 1, 1998, pp. 15-24.
- Lieberman 97      **A Multi-Scale, Multi-Layer, Translucent Virtual Space**, Henry Lieberman, IEEE International Conference on Information Visualization, London, September 1997.
- Lieberman et al. 97      **Introduction and Guest Editor, Special Issue on the Debugging Scandal**, Henry Lieberman, Communications of the ACM, April 1997.
- Ungar, Lieberman & Fry 97      **Debugging and the Experience of Immediacy**, Dave Ungar, Henry Lieberman, and Christopher Fry. Communications of the ACM, April 1997.

- Lieberman 97      **Autonomous Interface Agents**, Henry Lieberman, ACM Conference on Human-Computer Interface [CHI-97], Atlanta, March 1997.
- Lieberman & Fry 97      **ZStep 95: A Reversible, Animated, Source Code Stepper**, Henry Lieberman and Christopher Fry, in *Software Visualization: Programming as a Multimedia Experience*, John Stasko, John Domingue, Marc Brown, and Blaine Price, eds., MIT Press, Cambridge, MA, 1997.
- Lieberman & Maulsby 96      **Instructible Agents: Software That Just Keeps Getting Better**, Henry Lieberman and David Maulsby. *IBM Systems Journal*, Volume 35, Nos. 3 & 4, 1996.
- Lieberman 96      **Intelligent Graphics: A New Paradigm**, Henry Lieberman, Communications of the ACM, August 1996, [Special Issue on *New Paradigms for Using Computers*].
- Lieberman 95      **The Visual Language of Experts in Graphic Design**, Henry Lieberman, IEEE Symposium on Visual Languages, Darmstadt, Germany, September 1995.
- Lieberman 95      **A Demonstrational Interface for Recording Technical Procedures by Annotation of Videotaped Examples**, Henry Lieberman, *International Journal of Human-Computer Studies*, Vol. 43, pp. 383-417, 1995.
- Stoehr & Lieberman 95      **Hearing Aid: Adding Verbal Hints to a Learning Interface**, Elizabeth Stoehr and Henry Lieberman, ACM Multimedia Conference, San Francisco, November 1995.
- Lieberman 95      **Interaction is the Key to Machine Learning Applications**, Henry Lieberman, Workshop on Programming by Demonstration and Learning from Examples, Machine Learning Conference, Lake Tahoe, California, July 1995.
- Lieberman 95      **Letizia: An Agent That Assists Web Browsing**, Henry Lieberman, International Joint Conference on Artificial Intelligence, Montréal, August 1995.

- Lieberman & Fry 95 **Bridging the Gap Between Code and Behavior in Programming**, Henry Lieberman and Christopher Fry, ACM Conference on Computers and Human Interface [CHI-95], Denver, April 1995.
- Lieberman 94 **Powers of Ten Thousand: Navigating In Large Information Spaces**, Henry Lieberman, Conference on User Interface Software Technology, Marina del Rey, California, November 1994.
- Lieberman 94 **A User Interface for Knowledge Acquisition from Video**, Henry Lieberman, Conference of the American Association for Artificial Intelligence, Seattle, August 1994.
- Lieberman & Fry 94 **Integrating Code and Data Visualization**, Henry Lieberman, and Christopher Fry, CHI Workshop on Software Visualization, Boston, May 1994.
- Lieberman 94 **Demonstrational Techniques for Instructible Interface Agents**, Henry Lieberman, AAI Workshop on Software Agents, Stanford, CA, March 1994.
- Lieberman 93 **Graphical Annotation as a Visual Language for Specifying Generalization Relations**, Henry Lieberman, in IEEE Symposium on Visual Languages, Bergen, Norway, August 1993.
- Lieberman 93 **Mondrian: A Teachable Graphical Editor (demonstration)**, Henry Lieberman, ACM InterCHI Conference, Amsterdam, p. 144, May 1993.
- Cypher, et. al. 93 The following three articles appear in a book, **Watch What I Do: Programming by Demonstration** edited by Allen Cypher, co-edited by David Kurlander, Henry Lieberman, David Maulsby Brad Myers, and Alan Turransky, published by MIT Press, April 1993.
- Lieberman 93 **Mondrian: A Teachable Graphical Editor**, Henry Lieberman, in [Cypher et. al. 93].
- Lieberman 93 **Making Programming Accessible to Visual Problem Solvers**, Henry Lieberman, in [Cypher et. al. 93].

- Lieberman 93     **Tinker: A Programming by Demonstration System for Beginning Programmers**, Henry Lieberman, in [Cypher et. al. 93].
- Contribution was also made to a history of the field, bibliography, test suite, and other supporting material for the book.
- Lieberman 92     **Dominos and Storyboards: Beyond Icons on Strings.** Henry Lieberman, IEEE Conference on Visual Languages, Seattle, September 1992. (Presented as an invited keynote address)
- Lieberman 92     **Capturing Design Expertise Interactively by Example**, Henry Lieberman, in East-West Conference on Human-Computer Interaction, St. Petersburg, Russia, August 1992.
- Lieberman 92     **Object-Oriented Programming**, Henry Lieberman, article in Macmillan Encyclopaedia of Computers, 1992.
- Lieberman 91     **Machine Tongues: Object-Oriented Programming**, Henry Lieberman, in The Well-Tempered Object: Musical Applications of Object-Oriented Software Technology, Stephen Pope, ed., MIT Press, 1991
- Lieberman 91     **A Three-Dimensional Representation for Program Execution**, Henry Lieberman, in E.P. Glinert, ed, Visual Programming Environments: Applications and Issues, IEEE Press, 1991. Also in IEEE Conference on Visual Languages, Rome, 1989.
- Arent, Vertelney, Lieberman 89     **Two Disciplines in Search of an Interface: Reflections on a Design Problem**, Michael Arent, Laurie Vertelney, and Henry Lieberman, in The Art of Human-Computer Interface Design, Brenda Laurel, ed., Addison-Wesley, August 1989
- Lieberman 89     **Visual Programming: A Vision for the Future**, Henry Lieberman, in Friend-21 Conference on Human Interface Technologies, Tokyo, September 1989. Invited address.

- Lieberman 89     **User Interfaces for Program Debugging**, Henry Lieberman, Tutorial at ACM Computers and Human Interaction Conference, Austin, Texas, 1989.
- Lieberman 89     **Parallelism in Interpreters for Knowledge Representation Languages**, Henry Lieberman, in Concepts and Characteristics of Knowledge-Based Systems, M. Tokoro, Y. Anzai, A. Yonezawa, eds., North-Holland, 1989
- Lieberman 88     **Towards Intelligent Interfaces for Graphic Design Applications**, Henry Lieberman, International Conference on Fifth Generation Computer Systems, Tokyo, November 1988
- Stein, Lieberman,  
Ungar 88     **The Treaty of Orlando: A Shared View of Sharing**, Lynn Stein, Henry Lieberman, and David Ungar, in Object-Oriented Concepts, Applications and Databases, Won Kim and Fred Lochovsky, eds., Addison-Wesley, 1988
- Lieberman 87     **Reversible Object-Oriented Interpreters**, Henry Lieberman, First European Conference on Object-Oriented Programming, Paris, France, Springer-Verlag, 1987.
- Lieberman 87     **Using Prototypical Objects to Implement Shared Behavior in Object-Oriented Systems**, Henry Lieberman, First Conference on Object-Oriented Programming Languages, Systems, and Applications [OOPSLA-86], ACM SigCHI, Portland, Oregon, September 1986. Also in Object-Oriented Computing, Gerald Peterson, ed., IEEE Computer Society Press, 1987.
- Lieberman 87     **Concurrent Object Oriented Programming in Act 1**, Henry Lieberman, in Object Oriented Concurrent Programming, Aki Yonezawa and Mario Tokoro, eds., MIT Press, 1987
- Lieberman 87     **An Example Oriented Environment for Beginning Programmers**, Henry Lieberman, in Artificial Intelligence and Education, R. Lawler and M. Yazdani,

eds., Ellis Horwood, Chichester, England, 1987. Also in the Instructional Sciences Journal.

- Lieberman 87 **Expecting the Unpredictable: When Computers Can Think in Parallel**, Henry Lieberman, in Matters of Intelligence, Lucia Vaina, ed., D. Reidel, 1987.
- Lieberman 85 **There's More to Menu Systems Than Meets the Screen**, Henry Lieberman, ACM SigGraph '85 Computer Graphics Conference, San Francisco, July 1985.
- Lieberman 84 **Steps Toward Better Debugging Tools for Lisp**, Henry Lieberman, ACM Symposium on Lisp and Functional Programming, Austin, Texas, August 1984
- Lieberman 84 **Seeing What Your Programs Are Doing**, Henry Lieberman, International Journal of Man-Machine Studies, July 1984.
- Hewitt, Lieberman 84 **Design Issues in Parallel Architectures for Artificial Intelligence**, Carl Hewitt, Henry Lieberman, IEEE Comcon Conference, March 1984.
- Lieberman 83 **An Object-Oriented Simulator for the Apiary**, Henry Lieberman, Conference of the American Association for Artificial Intelligence, Washington, D. C., August 1983.
- Lieberman , Hewitt 83 **A Real Time Garbage Collector Based On The Lifetimes of Objects**, Henry Lieberman and Carl Hewitt, Communications of the ACM, June 1983. In Towards Open Information Systems Science, Carl Hewitt and Gul Agha, eds., MIT Press, 1987.
- Lieberman 82 **Designing Interactive Systems From The User's Viewpoint**, Henry Lieberman, in Integrated Interactive Computer Systems, P. Degano and E. Sandewall, eds., North Holland, 1982.
- Lieberman 82 **Constructing Graphical User Interfaces by Example**, Henry Lieberman, Graphics Interface Conference, Toronto, Ontario, Canada, May 1982.
- Lieberman 81 **Tinker: Example-Based Programming for Artificial Intelligence**, Henry Lieberman, 7th International Joint



Conference on Artificial Intelligence (IJCAI), Vancouver, B. C., Canada, August 1981.

Lieberman, Hewitt 80

**A Session with Tinker: Interleaving Program Testing With Program Design**, Henry Lieberman and Carl Hewitt, Proceedings of the First Lisp Conference, Stanford University, August 1980.

Hewitt, Lieberman,  
Attardi 79

**Security and Modularity in Message Passing**, Carl Hewitt, Henry Lieberman and Giuseppe Attardi), First International Conference on Distributed Computing, Huntsville, Ala., October 1979.

Hewitt, Attardi,  
Lieberman 79

**Specifying And Proving Properties Of Guardians For Distributed Systems**, Carl Hewitt, Giuseppe Attardi and Henry Lieberman, In Semantics of Concurrent Computation, Springer-Verlag Computer Science Series No. 70.

Lieberman 78

**How To Color In A Coloring Book**, Henry Lieberman, SigGraph Computer Graphics Conference, Atlanta, Georgia, August 1978.

Kahn, Lieberman 77

**Computer Animation: Snow White's Dream Machine** Kenneth Kahn and Henry Lieberman, Technology Review, October-November 1977.

Lieberman 76

**The TV Turtle: A Logo Graphics System for Raster Displays**, Henry Lieberman, SigGraph/SigPlan Graphics Languages Symposium, Miami Beach, Florida, April 1976.