



Henry A. Lieberman

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Home Page **<http://www.media.mit.edu/~lieber/>**

Lieberman's home page contains descriptions of research and teaching activities, many color illustrations, full papers in several formats, downloadable demonstrations of software projects, and more complete and up-to-date information than is possible in this hardcopy.

Born 1 March 1952, New York City.
Citizenship USA

Employment

Research Scientist, MIT Media Laboratory

1987-Present
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 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.

Lately, his work has concerned using a new approach to 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.

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 is also working 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 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, and he taught his course and wrote technical papers in French.

1977-1987 **Research Scientist, MIT Artificial Intelligence Laboratory and Laboratory for Computer Science**

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, 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's system for programming by example, *Tinker*, exploits the cognitive power of concrete examples to aid teaching and learning. *Tinker* permits a user to write a program by presenting examples to the machine and graphically demonstrating the steps of the procedure on the examples. The system remembers the steps, which can be generalized to apply to new examples. It is directed not only toward applications in artificial intelligence, but also to the needs of beginning users.

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**

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 and the first color Logo graphics systems, 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 College; 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, and at other universities.

Awards and Honors	<p>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.</p> <p>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.</p> <p>He is listed in <i>Who's Who in America</i>, Marquis, 2009.</p>
Sponsored research	<p>The MIT Media Lab has a “consortium” funding model, where sponsors pay a membership fee to the Lab, and do not normally fund individual projects or researchers. The vast majority of this funding comes from industry rather than government. See the “Sponsors” section of the Media Lab website. His research group operates at an average annual budget of about \$250,000/year.</p> <p>The Lab does occasionally accept “directed” research, or “unrestricted gift” grants. Among Lieberman’s direct sponsors have been Alenia, Apple Computer, British Telecom, the European Union, Hewlett-Packard, IBM, Kansa, Kodak, The Mind-Machine Project, Microsoft, Systems Development Foundation, the US Defense Advance Projects Research Agency, the US National Science Foundation, the US Office of Naval Research, and Xerox.</p>
Lectures	<p>Lieberman has delivered invited lectures on his research at conferences and at most major academic and industrial research centers throughout the USA, Europe and the Far East. A list is available upon request.</p> <p>He has delivered invited keynote speeches at:</p> <ul style="list-style-type: none"> • 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 served as conference chair and program committee member for major international conferences, (PC member unless otherwise indicated), including

- Program Chair, ACM International Conference on Intelligent User Interfaces, (IUI) 2000, and 2008
- ACM International Conference on Intelligent User Interfaces (IUI), Program Committee member, 2000-2009
- 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 is an Associate Editor of the journal *ACM Transactions on Intelligent Information Systems* (TIIS, <http://tiis.acm.org/>).

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]
- *Journal of Interactive Media in Education* [Open University, UK]
- *Communication, Computers and Artificial Intelligence* [University of Ghent, Belgium].

Industrial consulting

Lieberman has consulted on a number of projects in the computer industry. He has worked as a consultant to 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 group charged with implementing Apple's Knowledge Navigator vision. 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 ATG 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.

During 1984-87 he was a consultant to the Atari Cambridge Research Lab, founded by Alan Kay.

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 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 in the Computer Art Show at SigGraph, 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

Ph.D. equivalent

Habilitation à Diriger des Recherches en Informatique

University of Paris VI Pierre and Marie Curie, 1990.

The *Habilitation à Diriger des Recherches*, 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: *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 1,390th most frequently cited author of all time in Computer Science, according to Citeseer (March 2007) :-).

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.

Ko, et. al 10

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., Accepted for publication in *ACM Computing Surveys*, to appear.

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. 10 **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.
- 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 an 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 an Architecture**, Rachelle 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
09 **A Goal-Oriented Web Browser**. Alex Faaborg and Henry Lieberman, in *End-User Programming for the Web*, Allen Cypher, Mira Dontcheva, Tessa Lau and Jeff Nichols, eds., 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.
- 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.
- Gouldstone, Liu, Lieberman, Ishii 06 **Saurus: An Emotionally Weighted Thesaurus**, (with Jim Gouldstone, Hugo Liu, 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), 20th Anniversary Panel: The Past and Future of Object-Oriented Programming, Nantes, France, July 2006.
- Teng, Shen, Lieberman, Maes 06 **Your Memory, Connected**, (with 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?** (with Junia Anacleto, 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**. (with Alex Faaborg), 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)**, (with Rada Mihalcea and Hugo Liu), 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**, (with 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**. (with C-H. Lee, L. Bonnani, J. Espinosa, T. Selker), International Conference on Intelligent User Interfaces, Sydney, January 2006.
- Lieberman, Paterno and Wulf, eds. 06 **End-User Development**, (Book editor, with 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**, (with Hugo Liu), 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, Lieberman, Paterno and Wulf, eds., Kluwer Academic Publishers, 2005.

- Chung, Kern, and Lieberman 05 **Topic Spotting Common Sense Translation Assistant** (with Jaewoo Chung and Rachel Kern), ACM Conference on Human-Computer Interaction (CHI-2005), Portland, OR, April 2005.
- Liu and Lieberman 05 **Metafor: Visualizing Stories as Code**, 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.** (with 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**, (with Hugo Liu, Push Singh, and Barbara Barry), *AI Magazine*, American Association for Artificial Intelligence, Winter 2004-2005.
- Lieberman, Faaborg, Espinosa, Stocky 04 **Common Sense on the Go: Giving Mobile Applications an Understanding of Everyday Life**, (with 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**, (with Tom Stocky and Alexander Faaborg), 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**, (with Ashwani Kumar and Sharad Sundararajan) 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**, (with Earl Wagner) ACM Conference on Intelligent User Interfaces, Funchal, Madeira, Portugal, January 2004.
- Wagner and Lieberman 04b **Personalized Presentation of Policies and Processes**, (with Earl Wagner) 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**, (with Earl Wagner), 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**, (with Earl Wagner), ACM Conference on Electronic Commerce, San Diego, June 2003.
- Liu, Selker, Lieberman 03 **Visualizing the Affective Structure of a Text Document**, (with Hugo Liu and Ted Selker) Conference on Human Factors in Computing Systems (CHI 03), Ft. Lauderdale, Florida.

- Lieberman and Wagner 03 **End-User Debugging for Electronic Commerce**, (with Earl Wanger) ACM Conference on Intelligent User Interfaces, Miami Beach, January 2003.
- Liu, Lieberman, Selker 03 **A Model of Textual Affect Sensing using Real-World Knowledge**. (with Hugo Liu 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**, (with Taly Sharon and Ted Selker), ACM Conference on Intelligent User Interfaces, Miami Beach, January 2003.
- Lieberman, Fry, Plusch 03 **Static and Dynamic Semantics of the Web**, (with 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**, (with Taly Sharon 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** (with Hugo Liu), Conference on Adaptive Hypermedia and Adaptive Web Systems, Malaga, Spain, May 2002.
- Liu and Lieberman 02 **Robust Photo Retrieval Using World Semantics** (with Hugo Liu). 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**, (with Hugo Liu 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**, ACM Conference on Computers and Human Interaction (CHI-2002), Minneapolis, MN, USA, April 2002.
- Lieberman and Mason 02 **Intelligent Agent Software for Medicine** (with Cindy Mason), in *Future of Health Technology*, Renata Bushko, ed., IOS Press, Amsterdam, 2002.
- Lieberman and Selker 02 **Agents for the User Interface**, (with 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**, in *Imitation in Natural and Artificial Systems*, Kirsten Dautenhahn and Chrystopher Nehaniv, eds., MIT Press, 2002.

- Lieberman, Fry, & Weitzman 01 **Exploring the Web with Reconnaissance Agents**, Communications of the ACM, August 2001. With Christopher Fry and Louis Weitzman, pp. 69-75.
- Lieberman, Rosenzweig and Singh 01 **An Agent for Integrated Annotation and Retrieval of Images**, IEEE Computer, July 2001, pp. 57-61. With Elizabeth Rosenzweig and Push Singh.
- Lieberman, ed. 01 **Your Wish is My Command: Programming by Example** (book editor), Morgan Kauffman, San Francisco, 2001.
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