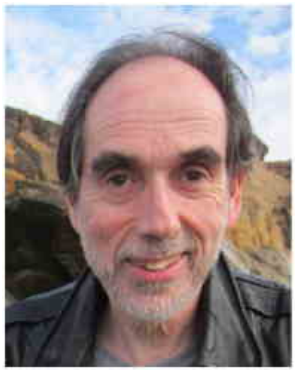

Henry A. Lieberman

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MIT Computer Science & Artificial Intelligence Lab (CSAIL)
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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 on story understanding, story generation, and the use of Commonsense knowledge and analogical reasoning in cognitive systems.

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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

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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)**

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.

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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, especially for parallel and distributed AI systems. 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 lead to the acceptance of garbage collection in mainstream computer languages, making possible languages like Java, Python, and C#. He introduced the technique of *delegation,* now used in languages like JavaScript, 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 was the sole editor of the only other 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)**

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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:

- Why Can't We All Just Get Along? (with C. Fry)
- 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],
- AI/Interface Software Workshop [with Hal Abelson],
- Programming systems for beginning and non-professional users [with M. Resnick]
- Computer Graphics Workshop course [with M. Cooper and R. MacNeil]
- 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

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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

In 2020, Lieberman was named **UNESCO Cross-Cultural Ambassador for Peace** by the UNESCO Center for Peace, at a United Nations celebration for Nelson Mandela's birthday. He was faculty for the 2020 and 2021 International Model United Nations STEM program, and delivered an invited talk entitled, "Peace in Your Lifetime".

He received the **2018 Impact Award**, along with co-authors Hugo Liu and Ted Selker, from the **ACM Intelligent User Interfaces Conference**. An Impact Award is given to a paper over ten years old, which has been deemed to have had significant impact on the field in the intervening time. This was for their paper entitled, "A Model of Textual Affect Sensing using Real-World Knowledge".

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 of his appearances were mentioned on the White House blog. He was also invited to a 2014 White House data analysis innovation conference by the US Consumer Financial Protection Bureau.

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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

Lieberman's research at MIT CSAIL is currently sponsored primarily by the US Air Force Office of Scientific Research (AFOSR) and the US Defense Advanced Research Projects Agency (DARPA).

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. See the "Sponsors" section of the Media Lab website.

The Media Lab also accepts "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, British Telecom, the European Union, Hewlett-Packard, Google, 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

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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.

He has delivered invited keynote speeches at:

- Psychology of Programming Interest Group Conference (PPIG), Milton Keynes, UK, October 2022.
- Cooperation as the Basis for Peace, Peaceland Nigeria, Lagos, UNESCO Center for Peace, October 2020.
- BayCHI, San Francisco Bay Area ACM SigCHI Interest group on Computers and Human Interaction, October 2020.
- United Nations 75th Anniversary, International Day of Peace, UNESCO Center for Peace, New York, September 2020.
- Toronto-Ottawa Heart Summit (Cardiology), Toronto, June 2018.
- Workshop on GDPR (European data privacy regulations), ACM Computers and Human Interaction Conference, April 2018.
- TEDx Beacon Street, one of the most prestigious and popular of the TEDx franchises, November 2017.
- 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, AAAI 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. Advisory Board, November 2018-Present. "Transactions" are the ACM professional society's flagship journals. He writes the ACM TiiS blog.
- 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

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- 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 (KCVC-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

- *ACM Transactions on Interactive Intelligent Systems* [Association for Computing Machinery]
- *Journal of Autonomous Agents and Multi-Agent Systems* [Kluwer]

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- *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].

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.

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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 Fenwick & West; Sidley Austin; DLA Piper; Fish & Richardson; 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), 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

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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)

He has an *h-number* (measure of citation impact) of **57** (according to Google Scholar, March 2020). Wikipedia says an h-number of **45** is "equivalent to a member of the National Academy of Sciences").

Lieberman is the 1390th most frequently cited author in Computer Science, (according to CiteseerX). In rankings by Guide2Research, he was ranked the 1336th Top Computer Scientist in the USA, and the 2468th Top Computer Scientist in the World (https://guide2research.com/scientists/US, May 2021).

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Yin, Colon-Hernandez, Lieberman 22	**Getting Help From the Neighborhood: Local Semantic Averaging for Commonsense Inference in Language Models**, Claire Yin, Pedro Colon-Hernandez, Henry Lieberman, Conference on Advances in Cognitive Systems, Washington, DC, November 2022.
Xin, Lieberman, Colon-Hernandez 22	**Asking Language Models to Explain Pronoun-Ambiguous Sentences**, Yida Xin, Henry Lieberman and Pedro Colon-Hernandez, Conference on Advances in Cognitive Systems, Washington, DC, November 2022.
Xin, Lieberman, Chin 21	**PatchComm: Using Commonsense Knowledge to Guide Syntactic Parsers**, Yida Xin, Henry Lieberman, Peter Chin, International Conference on Principles of Knowledge Representation and Reasoning (KR 21), November 2021.
Dinakar and Lieberman 21	**Lensing Machines: Representing Perspective in Latent Variable Models**, Karthik Dinakar and Henry Lieberman, Conference on Advances in Cognitive Systems (ACS-21), Online, November 2021.
Colon-Hernandez, Xin, Lieberman, Havasi, Breazeal 21	**RetroGAN: A Cyclic Post-Specialization System for Improving Out-of-Knowledge and Rare Word Representations**. Pedro Colon-Hernandez, Yida Xin, Henry Lieberman, Catherine Havasi, Cynthia Breazeal, Conference of the Association of Computational Linguistics / International Joint Conference on Natural Language Processing (ACL/IJNLP), August 2021.
Solomon, et al. 21	**History of Logo**, Cynthia Solomon, Brian Silverman, Henry Lieberman, Brian Harvey, Mark L. Miller, Ken Kahn, Margaret Minsky, Artemis Papert, Fourth International Conference on the History of Programming Languages (HOPL4), London, June 2021.
Fry, Lieberman 20	**Great User Interface can Promote the "Do Everything Ourselves" Economy**, Christopher Fry and Henry Lieberman, Human-Computer Interaction International Conference (HCII-20), Copenhagen, July 2020.
Lieberman 20	**Intrinsic and Extrinsic Motivation in Intelligent Systems**, Henry Lieberman, First International Workshop on Self-Supervised Learning, Cambridge, MA, February

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2020. Proceedings of Machine Learning Research 131:62-71.

Colon-Hernandez, Lieberman, Havasi 19 — **Does a Dog Desire Cake?: Expanding Knowledge Base Assertions Using Relationship Discovery**, Pedro Colon-Hernandez, Henry Lieberman, Catherine Havasi, Conference on Neural Information Processing (Neurips), Workshop on Knowledge Representation and Machine Learning, Vancouver, December 2019.

Lieberman, Williams, Winston 19 — **Commonsense Reasoning for Story Understanding**, Henry Lieberman, Bryan Williams, Patrick Winston, Advances in Cognitive Systems, Workshop on Story-Enabled Intelligence, Cambridge, MA, August 2019.

Lieberman 19 — **In Robots We Trust?**, Henry Lieberman, ACM Transactions on Intelligent Interactive Systems, Blog Editor's post, February 2019. **https://medium.com/acm-tiis**

Lieberman, Kuo, Staneva 18 — **Debugging Probabilistic Programming: Lessons from Debugging Research**, Henry Lieberman, Yen-Ling Kuo, Valeria Staneva, 1st Conference on Probabilistic Programming, Cambridge, MA, October 2018.

Lieberman, Fry 18 — **Hippies Values Really Did Build the Internet**, Henry Lieberman and Christopher Fry, Communications of the ACM, September 2018. Includes commentary also by New York Times journalist John Markoff, and CACM editors Andrew Chien and Moshe Vardi.

Lieberman 18 — **Wearing Our Hearts on Our Sleeves,** ACM Transactions on Intelligent Interactive Systems, Blog Editor's post, November 2018. **https://medium.com/acm-tiis**

Lieberman 18 — **Pay Attention to the Man Behind the Curtain**, ACM Transactions on Intelligent Interactive Systems, Special Issue on Human-Centered Machine Learning, Blog Editor's post, August 2018. **https://medium.com/acm-tiis**

Lieberman 18 — **Owning the Wind**, Invited presentation, Workshop on GDPR (EU regulations on data privacy), Computers and

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Human Interaction Conference (CHI-18) Montréal, April 2018.

Fry and Lieberman 18 — ***Why Can't We All Just Get Along?: How Science Can Enable A More Cooperative Future***, Christopher Fry and Henry Lieberman, self-published book, 2018, http://www.whycantwe.org/

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.

Lieberman 17 — **Why Can't We All Just Get Along?,** TED talk, Boston, November 2017. https://www.ted.com/talks/henry_lieberman_why_can_t_we_all_just_get_along

Forbus, Kuipers Lieberman, 16 — **Remembering Marvin Minsky**, Ken Forbus, Ben Kuipers, and Henry Lieberman, *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 of 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, 8th

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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,

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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.

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(Retaining Party Underlined)

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21. *IBM v. Intellectual Ventures*, IPR2015-00089 & 2015-00092 (PTAB)
22. *Hulu v. Chinook Licensing DE, LLC*, IPR2015-00625 (PTAB)