

# Curriculum Vitae of DAVID “JACK” MOSTOW

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## Positions Held

- 1992 – Carnegie Mellon University School of Computer Science: Research Professor (since 1999) of Robotics, Language Technologies, Human-Computer Interaction, and Machine Learning
- 1992 – Founder and Director of Project LISTEN ([www.cs.cmu.edu/~listen](http://www.cs.cmu.edu/~listen)) to develop, evaluate, and refine an automated Reading Tutor that listens to children read aloud, and helps them learn to read
- 1985-92 Rutgers University: Assistant Professor of Computer Science; 1990 Full Member of Graduate Faculty
- 1989 IBM Tokyo Research Laboratory: Visiting Scientist (summer)
- 1981-85 University of Southern CA Information Sciences Institute: Research Computer Scientist
- 1980-81 Stanford University Heuristic Programming Project: Research Associate
- 1977-81 Rand Corporation Information Sciences Department: Consultant

## Education

- 1974-81 Ph.D., Computer Science, Carnegie-Mellon University  
National Science Foundation Graduate Fellow  
Dissertation: *Mechanical Transformation of Task Heuristics into Operational Procedures*  
Committee: Frederick Hayes-Roth, Allan Newell, Jaime Carbonell, Robert Balzer (USC-ISI)
- 1970-74 A.B. *cum laude*, Applied Mathematics, Harvard University (National Merit Scholar)

## Language study

English (native), French (years), Hebrew (years), German (year), Spanish (semester), others (smattering)

## Awards and Honors

- 2010-15 **President and Secretary/Treasurer of the International Artificial Intelligence in Education Society:** wrote the Educational Data Mining Song and AIED Song, now sung at conferences by popular demand
- 2013 **Best Paper Finalist**, 16<sup>th</sup> International Conference on AI in Education, *Comparing Student Models in Different Formalisms by Predicting their Impact on Help Success*. S. Lallé, J. Mostow, V. Luengo, N. Guin.
- 2012 **Best Student Paper Award**, 5<sup>th</sup> International Conference on Educational Data Mining: *Comparison of Methods to Trace Multiple Subskills: Is LR-DBN Best?* Y. Xu and J. Mostow.
- 2012 **Best Paper Award**, 25<sup>th</sup> Florida Artificial Intelligence Research Society Conference (FLAIRS-25): *Mining Data from Project LISTEN's Reading Tutor to Analyze Development of Children's Oral Reading Prosody*. S. Sitaram and J. Mostow.
- 2011 **Best Paper Nominee**, 15<sup>th</sup> International Conference on Artificial Intelligence in Education: *Toward Exploiting EEG Input in a Reading Tutor*. J. Mostow, K.-m. Chang, and J. Nelson.
- 2011 **Best Poster Nominee**, 4<sup>th</sup> International Conference on Educational Data Mining: *Logistic Regression in a Dynamic Bayes Net Models Multiple Subskills Better!* Y. Xu and J. Mostow.
- 2008 **Best Paper Award**, 9<sup>th</sup> International Conference on Intelligent Tutoring Systems: *Does help help? Introducing the Bayesian Evaluation and Assessment methodology*. J. Beck, K. Chang, J. Mostow, A. Corbett.

- 2008 **Best Paper Nominee**, 9<sup>th</sup> International Conference on Intelligent Tutoring Systems: *How who should practice: Using learning decomposition to evaluate the efficacy of different types of practice for different types of students*. J. Beck and J. Mostow.
- 2005 Poster on Project LISTEN chosen by NSF for Information Technology Research Committee of Visitors
- 2004 Listed by [Pittsburgh Post-Gazette](#) as “having a significant impact on education”
- 2003 **Allen Newell Award for Research Excellence** ([www.scs.cmu.edu/people/achievements/newell](http://www.scs.cmu.edu/people/achievements/newell))
- 2002 Elected to Voting Membership in the Society for Scientific Studies of Learning
- 2000 Project LISTEN **included in National Science Foundation’s Nifty Fifty** (<http://www.nsf.gov/od/lpa/nsf50/nsfoutreach/htm/home.htm>)
- 1998 “Project LISTEN: A Reading Tutor That Listens” chosen to represent Computing Research Association (CRA) at May 20 Coalition for National Science Funding Exhibit (CNSF) for Congress
- 1994 **Outstanding Paper Award**, 12<sup>th</sup> National Conference on Artificial Intelligence, *A Prototype Reading Coach that Listens*. J. Mostow, S. F. Roth, A. G. Hauptmann, and M. Kane.

## PROFESSIONAL ACTIVITIES

### Editorships

- 2014 – Guest Editor, special issue of *User Modeling and User-Adapted Interaction* on student modeling
- 2013 – Editorial Board, *Artificial Intelligence in Education*
- 2009 – Editorial Board, *Journal of Educational Data Mining*
- 1994-95 Editorial Board, *Artificial Intelligence Journal* Special Issue on Empirical Artificial Intelligence
- 1984-93 Action Editor / Editorial Board member, *Machine Learning*
- 1985-87 Editorial Board, *IEEE Transactions on Software Engineering*
- 1985 Guest Editor, *IEEE Transactions on Software Engineering* Special Issue on AI and Software Engineering

### Advisory Boards

- 2007 – Advisory Board, TechBridgeWorld ([www.techbridgeworld.org](http://www.techbridgeworld.org))
- 2007 – Elected to Executive Committee, International Artificial Intelligence in Education Society (IAIED)
- 2009-10 Steering Committee, 2010 Question Generation Shared Tasks
- 2008 Advisory Board, Project STEAM, SRI
- 2005-07 Consultant, Soliloquy Learning
- 2004 Chair, review panel for Inter-agency Educational Research Initiative grant proposals, NSF
- 2002 Committee of Visitors, NSF Research on Learning and Education (ROLE)
- 2001 – Advisory Board, Mid-Atlantic Regional Technology in Education Consortium (MAR\*TEC)
- 2001-02 Advisory Board, NSF Grant “Role of Emotion in Propelling the SMET Process” (Roz Picard, PI), MIT
- 1990-95 International Federation for Information Processing (IFIP) Working Group 12.2 (Machine Learning)

### Conference Leadership

- 2012-13 General Chair, 16<sup>th</sup> International Conference on Artificial Intelligence in Education, Memphis, TN
- 2009-10 Conference Chair, 10<sup>th</sup> International Conference on Intelligent Tutoring Systems, Pittsburgh, PA
- 2009 Interactive Events Chair, 13<sup>th</sup> International Conference on AI in Education, Brighton, UK
- 2004 Workshops & Tutorials Chair, 7<sup>th</sup> International Conference on Intelligent Tutoring Systems, Brazil

- 1999 25th Reunion Panel on "Science and Medicine near the Millennium," Harvard University
- 1996-98 Program Co-chair, 15<sup>th</sup> National Conference on Artificial Intelligence, Madison, WI

### **Conference Organizing Committees**

- 2012 5<sup>th</sup> Workshop on Question Generation (QG 2012) (cancelled due to too few good submissions)
- 2011 AAAI Symposium: 4<sup>th</sup> Workshop on Question Generation (QG 2011), Arlington, VA
- 2010 Steering Committee of the 3<sup>rd</sup> Workshop on Question Generation (QG 2010), Pittsburgh, PA
- 2008 Fall 2008 Workshop on Learning Technology, Pittsburgh, PA
- 2003 Doctoral Consortium and Local Organizing Committees, User Modeling Conference, Pittsburgh, PA
- 2002 ITS2002 Workshop on Empirical Methods for Tutorial Dialogue Systems
- 1992 AAAI92 Workshop on Design Rationale Capture and Use, San Jose, CA
- 1991 8<sup>th</sup> International Machine Learning Workshop, Northwestern University, Evanston, IL
- 1990 AAAI90 Workshop on Automated Generation of Approximations and Abstractions, Boston, MA
- 1989 6<sup>th</sup> International Workshop on Machine Learning, Cornell University
- 1986 Oregon State University Workshop on Knowledge Compilation, Otter Crest, OR
- 1984 Rutgers University Workshop on Knowledge-Based Design Aids: Models of the Design Process

### **Conference Program Committees**

- 2015 8<sup>th</sup> International Conference on Educational Data Mining, Madrid, Spain
- 2015 17<sup>th</sup> International Conference on Artificial Intelligence in Education, Madrid, Spain
- 2014 6<sup>th</sup> International Conference on Computer Supported Education, Barcelona, Spain
- 2014 Workshop on Innovative Use of NLP for Building Educational Applications, Baltimore, MD
- 2014 7<sup>th</sup> International Conference on Educational Data Mining, London, UK
- 2014 12<sup>th</sup> International Conference on Intelligent Tutoring Systems, Honolulu
- 2014 ITS2014 Workshop on Utilizing EEG Input in Intelligent Tutoring Systems, Honolulu
- 2013 AIED2013 Workshop on MOOCs, Memphis, TN
- 2013 16<sup>th</sup> International Artificial Intelligence in Education Conference, Memphis, TN
- 2013 5<sup>th</sup> International Conference on Computer Supported Education, Aachen, Germany
- 2012 5<sup>th</sup> International Conference on Educational Data Mining, Chania, Crete
- 2012 11<sup>th</sup> International Conference on Intelligent Tutoring Systems, Crete
- 2012 International Symposium on Automatic Detection of Errors in Pronunciation Training, Stockholm
- 2012 13<sup>th</sup> Annual Conference of the International Speech Communication Association, Portland, OR
- 2012 7<sup>th</sup> Workshop on Innovative Use of NLP for Building Educational Applications, Montreal
- 2011 4<sup>th</sup> International Conference on Educational Data Mining, Eindhoven, Netherlands
- 2011 15<sup>th</sup> International Artificial Intelligence in Education Conference, Auckland, NZ
- 2011 49<sup>th</sup> Annual Meeting of the Association for Computational Linguistics, Portland, OR
- 2011 6<sup>th</sup> Workshop on "Innovative Use of NLP for Building Educational Applications," Portland, OR
- 2010 ACM International Conference on Intelligent User Interfaces, Palo Alto, CA
- 2010 3<sup>rd</sup> International Conference on Educational Data Mining, Pittsburgh, PA
- 2009 2<sup>nd</sup> International Conference on Educational Data Mining, Córdoba, Spain

2009 AIED 2009 Workshop on Question Generation, Brighton, UK  
 2008 NSF Workshop on the Question Generation Task and Evaluation Challenge, Arlington, VA  
 2008 1<sup>st</sup> International Conference on Educational Data Mining, Montreal  
 2008 9<sup>th</sup> International Conference on Intelligent Tutoring Systems, Montreal  
 2007 12<sup>th</sup> International Conference on Artificial Intelligence in Education (AIED2007), Los Angeles  
 2006 8<sup>th</sup> International Conference on Intelligent Tutoring Systems (ITS 2006), Jhongli, Taiwan  
 2006 ITS2006 Workshop on Educational Data Mining, Jhongli, Taiwan  
 2006 AAAI2006 AI Nectar Program Committee, Boston, MA  
 2005 11<sup>th</sup> International Conference on Artificial Intelligence in Education, Amsterdam, Netherlands  
 2005 AIED2005 Workshop on Student Modeling for Language Tutors, Amsterdam  
 2005 AIED2005 Workshop on Usage Analysis, Amsterdam  
 2005 AIED2005 Workshop on Educational Games as Intelligent Learning Environments, Amsterdam  
 2005 AAAI2005 Workshop on Educational Data Mining, Pittsburgh, PA  
 2005 2<sup>nd</sup> Workshop on Building Educational Applications Using Natural Language Processing, Ann Arbor  
 2004 7<sup>th</sup> Intelligent Tutoring Systems Conference (ITS2004), Maceió, Alagoas, Brazil  
 2004 ITS2004 Workshop on Social and Emotional Intelligence in Learning Environments, Maceio, Brazil  
 2003 10<sup>th</sup> International Conference on Artificial Intelligence in Education, Sydney, Australia  
 2003 UM2003 Workshop on Modeling User Affect and Attitudes, Johnstown, PA  
 1991 12<sup>th</sup> International Joint Conference on Artificial Intelligence, Sydney, Australia  
 1991 9<sup>th</sup> National Conference on Artificial Intelligence, Anaheim, CA  
 1988 7<sup>th</sup> National Conference on Artificial Intelligence, Radisson-St. Paul, MN  
 1988 5<sup>th</sup> International Conference on Machine Learning, Ann Arbor, MI

## **Other Reviewing (Journals, Conferences, Books, Funding Agencies, Universities)**

*ACM Computing Surveys*

*ACM Transactions on Intelligent Systems and Technology*

*AI Magazine*

*Artificial Intelligence*

Automated Speech Recognition and Understanding Workshop

CA Microelectronics Innovation and Computer Research Opportunities (MICRO) program

CMU LTI Student Research Symposium

*Dialogue and Discourse*

*Handbook of Educational Data Mining*

*Human Computer Interaction*

*IEEE Computer*

*IEEE Expert*

*IEEE Intelligent Systems*

*IEEE Transactions on Computers*

*IEEE Transactions on Learning Technologies*

Institute of Education Sciences, United States Department of Education

International Artificial Intelligence in Education Conferences (AIED)  
 International Joint Conferences on Artificial Intelligence (IJCAI)  
*International Journal of Artificial Intelligence in Education*  
 Israel Academy of Sciences and Humanities Basic Research Foundation  
 Israel Science Foundation  
*Journal of Educational Data Mining*  
*Journal of Natural Language Engineering*  
*Language Learning & Technology*  
*Machine Learning*  
 National Conferences on Artificial Intelligence (AAAI)  
 National Science Foundation  
*Netherlands Organisation for Scientific Research*  
*Research in Engineering Design*  
 Social Sciences and Humanities Research Council of Canada  
*Speech Communication*  
 Université Joseph Fourier in Grenoble (referee for post-PhD “habilitation” diploma)  
 University of Sydney (refereed for a Thompson fellowship application)

## **STUDENTS (Carnegie Mellon except where noted otherwise)**

### **Graduate Degrees Supervised (some co-advised by G. Aist \*, J. Beck \*\*, or K. Chang \*\*\*)**

2015 Yueran Yuan, Computer Science master’s \*\*\*: analysis of children’s reading EEG  
 2013 José González-Brenes, Language Technologies PhD: *What and When Do Students Learn? Methods For Knowledge Tracing With Data-Driven Mapping of Items to Skills*  
 2012 Wei Chen, Language Technologies PhD: *Detecting Off-task Speech*  
 2012 Lucas Tan, Computer Science master’s \*\*\*: *Using a Low-cost EEG Sensor to Detect Mental States*  
 2012 Yanbo Xu, Language Technologies master’s: knowledge tracing of steps with multiple subskills  
 2012 Sunayana Sitaram, Language Technologies master’s: mining and visualizing oral reading prosody  
 2012 Mdahaduzzaman Munna, Language Technologies master’s: analysis of fluency practice scheduling  
 2011 Yuanpeng Li, Language Technologies master’s: analysis and visualization of oral reading prosody  
 2011 Weisi Duan, Language Technologies master’s: educational word sense disambiguation  
 2011 Lucas Tan, Computer Science senior thesis: automated classification of events in intelligent tutors  
 2010 Minh Duong, Language Technologies master’s: automated assessment of oral reading prosody  
 2010 Liu Liu, Language Technologies master’s \*: automated generation of example contexts for vocabulary  
 2009 Wei Chen, Language Technologies master’s \*: automated generation of comprehension instruction  
 2008 Xiaonan Zhang, Language Technologies master’s \*\*: mining educational data from a Reading Tutor that listens  
 2006 Kai-min Chang, Language Technologies master’s \*\*: educational data mining  
 2005 Cecily Heiner, Computer-Assisted Language Learning master’s \*\*: Automated Vocabulary Instruction  
 2004 June Sison, Language Technologies master’s \*\*: educational data mining

- 2002 Peng Jia, Masters' Project in Knowledge Discovery in Databases \*\*: *Mining computer tutor-student interaction data to assess students' reading and predict future behavior*
- 2001 Gregory Aist, Language Technologies PhD: *Helping Children Learn Vocabulary during Computer-Assisted Oral Reading. Distinguished Finalist for International Reading Association Outstanding Dissertation.*
- 1997 Gregory Aist, Computational Linguistics master's: *A General Architecture for a Real-Time Discourse Agent and a Case Study in Oral Reading Tutoring*
- 1996 Jeffrey Hill, Computational Linguistics master's: *Tolerating and Detecting Mispronunciations*
- 1993 Lorien Pratt, Computer Science PhD (Rutgers University): *Transferring Previously Learned Back-Propagation Neural Networks to New Learning Tasks.*
- 1992 Neeraj Bhatnagar, Computer Science PhD (Rutgers University): *On-line Learning from Search Failures*
- 1990 Armand Prieditis, Computer Science PhD (Rutgers University): *Discovering Effective Admissible Heuristics by Abstraction and Speedup: A Transformational Approach*

## Thesis Committees

- 2013 – Kevin Lenzo, Robotics PhD: *Characteristic Prosody and Meaning in Speech Synthesis*
- 2013-14 Colleen Davy, Psychology PhD: *Speech and Listening in the Acquisition of L2 Vocabulary and Morphosyntax*
- 2007-12 Nora Presson, Psychology PhD: *Applying Processing Models of Verb Morphology to an Instructional Intervention in Classroom Spanish*
- 2008-10 Min Chi, Intelligent Systems PhD (University of Pittsburgh): *Do Micro-Level Tutorial Decisions Matter: Applying Reinforcement Learning To Induce Pedagogical Tutorial Tactics*
- 2008 Ari Bader-Natal, Computer Science PhD (Brandeis University): *The Teacher's Dilemma: A game-based approach for motivating appropriate challenge among peers*
- 2007-09 Yvonne Kao, Psychology PhD: *Contributions of Spatial Skills To Geometry Achievement: Training And Transfer*
- 2005 Patrick Riley, Computer Science PhD: *Coaching: Learning and Using Environment and Agent Models for Advice*
- 1998 Lorin Grubb, Computer Science PhD: *Tracking Vocal Performances in an Ensemble Using Multiple Performance Parameters*
- 1997 Yuriko Murata, Computational Linguistics master's Project on mapping hirakana to kanji.
- 1990 William Cohen, Computer Science PhD (Rutgers University): *Concept Learning Using Explanation Based Generalization as an Abstraction Mechanism*
- 1990 Sridhar Mahadevan, Computer Science PhD (Rutgers University): *Learning Decomposition Methods to Improve Hierarchical Problem-solving Performance*
- 1990 Prasad Tadepalli, Computer Science PhD (Rutgers University): *Learning Approximate Plans in Games*
- 1989 Thomas Ellman, Computer Science PhD (Columbia University): *Explanation-Based Methods for Simplifying Intractable Theories*
- 1989 Keith Williamson, Computer Science M.Phil. (Rutgers University): *Database Schema Refinement*
- 1988 Smadar Kedar-Cabelli, Computer Science PhD (Rutgers University): *Formulating Concepts and Analogies According to Purpose*
- 1986 Richard M. Keller, Computer Science PhD (Rutgers University): *The Role of Explicit Contextual Knowledge in Learning Concepts to Improve Performance*

## Supervised Research (Carnegie Mellon graduate students except where noted)

- 2014 – Yi-Ting Huang, visiting PhD student from National Taiwan University: automated question generation
- 2014 Miguel Peralta, summer intern from Black Hawk College, Moline, IL: educational data mining
- 2014 Mentor for Pittsburgh Science of Learning Center Summer School, Educational Data Mining track
- 2013-14 Rahul Goutam, Language Technologies master's student: automated scoring of vocabulary examples
- 2013-14 Bhushan Ramnani, Computational Biology master's student: detecting mental states in keystrokes
- 2013 Diana Torres Olague, summer intern from New Mexico State University \*\*\*: analysis of children's EEG
- 2013 Sang Jin Han, undergraduate in Computer Science and Mathematics \*\*\*: analysis of children's EEG
- 2013 Yongjin Kwon, undergraduate in Computer Science \*\*\*: analysis of children's EEG while reading
- 2010-13 José P. González-Brenes, Language Technologies PhD student: detecting changes in tutorial interaction
- 2010 – Yanbo Xu, graduate student in Language Technologies: using Dynamic Bayes nets to model fluency
- 2012 Sébastien Lallé, visiting PhD student from Université Joseph Fourier, Grenoble, France: comparison of student model formalisms in predicting success of tutor help
- 2011-12 Lucas Tan, Computer Science master's student: finding temporal structure in single-channel EEG
- 2010-12 Vivian Chen, master's student in Language Technologies: using EEG to improve speech recognition (co-advised with Kai-min Chang)
- 2010-12 Hyeju Jang, master's student in Language Technologies: automated discovery of semantic relations
- 2010-12 Sunayana Sitaram, master's student in Language Technologies: automated assessment and visualization of children's oral reading prosody
- 2010-12 Mdahaduzzaman Munna, master's student in Language Technologies: model fluency growth
- 2009-12 Wei Chen, PhD student in Language Technologies: generating self-questioning instruction, understanding children's spoken questions, detecting off-task speech
- 2011-12 Yuanpeng Li, Visiting Scholar: evaluating and improving tracking of children's oral reading
- 2011 Udip Pant, summer intern from Brigham Young University \*\*\*: inferring comprehension from EEG
- 2011 Shanay Russell, junior in Psychology at Rutgers University: effects of story difficulty on fluency gains
- 2011 Mentor for Pittsburgh Science of Learning Center Summer School, Educational Data Mining track
- 2011 Denise Edwards, Information System sophomore: mapping Reading Tutor data into PSLC's DataShop
- 2010 Corinne Durette, summer intern from Temple University: taxonomy of children's free-form responses
- 2010 Matt Wagner, Xueqiong Qu, Chu Liu, and Siyu Shan: oral reading language model improvements
- 2009-10 Morten Rasmussen, PhD student from Aalborg University, Denmark: tracking children's oral reading
- 2009-10 Maxim Makatchev, Robotics PhD student: committee for research skills and writing qualifier
- 2009 Michael Heilman, language technologies PhD student: supervise PIER Field-Based Experience
- 2008 Qin Gong, Language Technologies master's \*: automated assessment of free-form spoken responses
- 2008 – Minh Duong, Language Technologies master's student: assessment of oral reading expressiveness
- 2008 – Liu Liu, Language Technologies master's student \*: automated generation of vocabulary instruction
- 2008–09 Haijun Gong and Tracy Sweet, Statistics grad students: *Impact of an Automated Reading Tutor in Ghana*
- 2007–09 G. Ayorkor Mills-Tettey, Robotics PhD student: controlled study of the Reading Tutor in Ghana
- 2007 Nathaniel Anozie, Elise Olson, and April Galyardt, Statistics grad students: *Evaluation of an Automated Reading Tutor in Pittsburgh Public Schools*
- 2006–07 Ling Xu and Vinithra Varadharajan [co-advised with Rahul Tongia]: automated ASL tutor for deaf kids

- 2006 G. Ayorkor Mills-Tettey, Robotics PhD student: applying robotic control concepts to automated tutors
- 2005 Nidhi Kalra, Robotics PhD student: advisory committee on a Braille writing tutor for the blind
- 2005 G. Ayorkor Mills-Tettey, Robotics PhD student: *Impact of an Automated Reading Tutor in Ghana*
- 2004 Hao Cen, Human-Computer Interaction PhD student \*\*: tool to browse student-tutor interactions
- 2004 Bob Poulsen, Computer Science master's thesis at DePaul University [unofficial co-advisor]: *Tutoring Bilingual Students With an Automated Reading Tutor That Listens: Results of a Two-Month Pilot Study*
- 2004 Peter Kant, Education Policy master's thesis at University of Pittsburgh: *The Influence of Teachers' Perceptions on Usage of an Educational Technology: A Study of Project LISTEN's Reading Tutor*
- 2004 Shanna Tellerman, Entertainment Technologies master's student: visual redesign of the Reading Tutor
- 2003–05 Cecily Heiner, Computer-Assisted Language Learning master's student \*\*: mine Reading Tutor data
- 2002-03 Satanjeev Banerjee, Language Technologies master's student: optimize Reading Tutor language model
- 2002-03 Wilson Tam, Language Technologies master's student: train confidence score
- 2002 Tameka Barrentine, Kate O'Leary, and Angela Wagner, HCI masters' students: children's motivation
- 2002 Peng Jia, master's in Automated Learning and Discovery \*\*: *Mining computer tutor-student interaction data to assess students' reading and predict future behavior.*
- 2002 Natasha Mohanty, summer intern from Mount Holyoke College: model children's spelling
- 2001 Micah Alpern, Katie Minardo, Maureen O'Toole, Amy Quinn, and Sean Ritzie, Human-Computer Interaction Lab group project: *Project LISTEN: Design Recommendations and Teacher Tool Prototype*
- 2000 James Fogarty, Laura Dabbish, and David Steck: mining a database of oral reading miscues
- 1997–98 Tzee-Ming Huang, Statistics PhD course project on predictive models of oral reading performance
- 1998 Peggy Chan and Calvin Yeung, Statistics master's project to estimate automated transcription errors
- 1997 Dan Barritt, HCI master's independent study: observe Reading Tutor use at an elementary school
- 1997 Kerry Perlmutter, Design master's project: graphical design of Reading Tutor interventions.
- 1983 Steve Minton, Computer Science PhD student: replay of design derivations
- 1983 Monica Lam, Computer Science PhD student: transformational derivation of systolic designs

### **Supervised Research (Computer Science PhD students elsewhere)**

- 1988-90 Greg Fisher: research assistantship and independent study (CS602) on knowledge compilation
- 1988 Kevin Kelly: research assistantship and independent study (CS602) on knowledge compilation
- 1987 William Cohen: research assistantship on the generalization-to-N problem in LEAP
- 1988 Barbara DiEugenio: independent study (CS601) on explanation in interactive design systems
- 1987 Dawn Cohen: research assistantship on heuristic theory formation
- 1987 Mukesh Dalal: independent study (CS601) on learning from execution traces
- 1987 Subrata Roy: independent study (CS602) on extending a learning apprentice for VLSI design
- 1986 Mike Barley: independent study (CS601) and research assistantship on automated reuse of design plans
- 1986-88 Tom Fawcett: independent study (CS601) on learning with partially-developed causal theories
- 1985-86 Kerstin Voigt: dissertation research (CS701) on integration of goals in design
- 1985 Patricia Friedmann: independent study (CS601) on AI and education
- 1985 Deborah McGuinness: independent study (CS601) on Automatic Programming
- 1983 Randy Kerber (USC computer science graduate student): derivation of a simple two-robot algorithm

# PUBLICATIONS

## Edited Books

1. Lane, H. C., Yacef, K., Mostow, J., & Pavlik, P. (Editors). 2013. *Proceedings of the 16th International Conference on Artificial Intelligence in Education*. Lecture Notes in Computer Science, 7926. Springer, Memphis, TN, xxxii+961 pp.
2. Alevan, V., Kay, J. and Mostow, J. (Editors) 2010. *Proceedings of the Tenth International Conference on Intelligent Tutoring Systems (ITS2010), Part I*. Lecture Notes in Computer Science, 6094. Springer, Pittsburgh, PA, xxx+437 pp.
3. Alevan, V., Kay, J. and Mostow, J. (Editors) 2010. *Proceedings of the Tenth International Conference on Intelligent Tutoring Systems (ITS2010), Part II*. Lecture Notes in Computer Science, 6095. Springer, Pittsburgh, PA, xxix+461 pp.
4. J. Mostow (editor). Special Issue on Artificial Intelligence and Software Engineering. *IEEE Transactions on Software Engineering SE-11(11):1253-1408*, November, 1985.

## Chapters in Books

5. Mostow, J., Beck, J., Cuneo, A., Gouvea, E., Heiner, C., & Juarez, O. (2010). Lessons from Project LISTEN's Session Browser. In C. Romero, S. Ventura, S. R. Viola, M. Pechenizkiy, & R. S. J. d. Baker (Eds.), *Handbook of Educational Data Mining*: Taylor & Francis Group, 389-416.
6. Mostow, J., Aist, G., Huang, C., Junker, B., Kennedy, R., Lan, H., Latimer, D., O'Connor, R., Tassone, R., Tobin, B., & Wierman, A. (2008). 4-Month evaluation of a learner-controlled Reading Tutor that listens. In V. M. Holland & F. P. Fisher (Eds.), *The Path of Speech Technologies in Computer Assisted Language Learning: From Research Toward Practice* (pp. 201-219). New York: Routledge.
7. Aist, G., & Mostow, J. (2008). Faster, better task choice in a reading tutor that listens. In V. M. Holland & F. P. Fisher (Eds.), *The Path of Speech Technologies in Computer Assisted Language Learning: From Research Toward Practice* (pp. 220-240). New York: Routledge.
8. Mostow, J. (2008). Evaluation purposes, excuses, and methods: Experience from a Reading Tutor that listens. In C. K. Kinzer & L. Verhoeven (Eds.), *Interactive Literacy Education: Facilitating Literacy Environments Through Technology*, pages 117-148. New York: Lawrence Erlbaum Associates, Taylor & Francis Group.
9. Mostow, J., & Beck, J. (2007). When the Rubber Meets the Road: Lessons from the In-School Adventures of an Automated Reading Tutor that Listens. In B. Schneider & S.-K. McDonald (Eds.), *Conceptualizing Scale-Up: Multidisciplinary Perspectives*, Vol. 2, pages 183-200). Lanham, MD: Rowman & Littlefield.
10. Mostow, J. and Aist, G. Evaluating tutors that listen. In K. Forbus and P. Feltoovich (Eds.) *Smart Machines in Education*, 169-234. MIT/AAAI Press. 2001.
11. J. Mostow, M. Barley, and T. Weinrich. Automated reuse of design plans in BOGART. In C. Tong and D. Sriram (editors), *Artificial Intelligence in Engineering Design*, chapter 2, pages 57-103. Academic Press, 1992. Revised version of paper in *International Journal for Artificial Intelligence in Engineering*, October 1989, volume 4, number 4, pages 181-196.
12. J. Mostow. A transformational approach to knowledge compilation: replayable derivations of task-specific heuristic search algorithms. In M. Lowry and R. McCartney (editors), *Automating Software Design*, chapter 10, pages 231-259. AAAI Press, 1991.
13. J. Mostow. Design by derivational analogy: issues in the automated replay of design plans. In J. Carbonell (editor), *Machine Learning: Paradigms and Methods*. MIT Press, 1990. Originally published in *Artificial Intelligence 40*: 1-3, September 1989, pages 119-184, Elsevier Science Publishers (North-Holland).

14. F. Hayes-Roth, D. J. Mostow, and P. Klahr. Knowledge acquisition, knowledge programming, and knowledge refinement. In P. Klahr and D. Waterman (editor), *Expert Systems: Techniques, Tools and Applications*, pages 310-349. Addison-Wesley, 1986.
15. J. Mostow. Why are design derivations hard to replay? In T. Mitchell, J. Carbonell, and R. Michalski (editors), *Machine Learning: A Guide to Current Research*, pages 213-218. Kluwer Academic Publishers, Hingham, MA, 1986. Revised and condensed version of paper in *Proceedings of the 3rd International Machine Learning Workshop*.
16. D. J. Mostow. Machine transformation of advice into a heuristic search procedure. In J. G. Carbonell, R. S. Michalski, and T. M. Mitchell (editors), *Machine Learning*, pages 367-403. Palo Alto, CA: Tioga, 1983.
17. F. Hayes-Roth, P. Klahr, and D. J. Mostow. Advice taking and knowledge refinement: an iterative view of skill acquisition. In J. A. Anderson (editor), *Cognitive Skills and their Acquisition*, pages 231-253. Erlbaum, 1981. Presented at 1980 Carnegie Symposium on Cognition, Pittsburgh, PA.
18. D. J. Mostow and F. Hayes-Roth. A production system for speech understanding. In D. A. Waterman and F. Hayes-Roth (editors), *Pattern-Directed Inference Systems*, pages 471-481. Academic Press, New York, 1978.
19. F. Hayes-Roth, D. J. Mostow, and M. Fox. Understanding speech in the Hearsay-II system. In L. Bolc (editor), *Speech Communication with Computers*, pages 9-42. Springer-Verlag, Berlin, 1978.

## Refereed Journal Papers

20. Mostow, J., Nelson-Taylor, J., & Beck, J. E. (2013). Computer-Guided Oral Reading versus Independent Practice: Comparison of Sustained Silent Reading to an Automated Reading Tutor that Listens. *Journal of Educational Computing Research*, 49(2), 249-276. doi: DOI: 10.2190/EC.49.2.g
21. Chen, W., Mostow, J., & Aist, G. S. (2013). Recognizing Young Readers' Spoken Questions. *International Journal of Artificial Intelligence in Education*, 21(4), 255-269.
22. Chang, K.-m., Nelson, J., Pant, U., & Mostow, J. (2013). Toward Exploiting EEG Input in a Reading Tutor. *International Journal of Artificial Intelligence in Education*, 22(1, "Best of AIED2011 Part 1"), 29-41.
23. Liu, L., Mostow, J., & Aist, G. S. (2013). Generating Example Contexts to Help Children Learn Word Meaning. *Journal of Natural Language Engineering*, 19(2), 187-212. doi: 10.1017/S1351324911000374
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37. M. Lam and J. Mostow (1985). A transformational model of VLSI systolic design. *IEEE Computer* 18(2):42-52.
38. J. Mostow (1984). A decision-based framework for comparing hardware compilers. *Journal of Systems and Software* (4):39-50. Reviewed in *ACM Computing Reviews*, November 1984, pages 509-510.
39. J. Mostow and B. Balzer (1984). Application of a transformational software development methodology to VLSI design. *Journal of Systems and Software* (4):51-61. Reviewed in *ACM Computing Reviews*, January 1985, page 73.

## Refereed Conference and Workshop Papers

40. Martin, L., Stone, M., Metzger, F., & Mostow, J. (2014, Dec. 7-10). *A Methodology for Using Crowdsourced Data to Measure Uncertainty in Natural Speech*. In 2014 IEEE Spoken Language Technology Workshop (SLT 2014), South Lake Tahoe, CA and NV.
41. Mostow, J., Adlof, S., Byard, J., Gates, D., Goutam, R., Kapelner, A., McKeown, M., Perfetti, C., & Yuan, Y. (2014, July 16 - 20). *Nutritious contexts: automatically identifying helpful examples for learning vocabulary words*. Poster at the Twenty-First Annual Meeting of the Society for the Scientific Study of Reading, Santa Fe, NM.
42. Xu, Y., Chang, K.-m., Yuan, Y., & Mostow, J. (2014, July 4-7). *Using EEG in Knowledge Tracing*. In Proceedings of the 7th International Conference on Educational Data Mining, 361-362. Institute of Education, London, UK.
43. Xu, Y. & Mostow, J. (2014, July 4). *A Unified 5-Dimensional Framework for Student Models*. In Proceedings of the EDM2014 Workshop on Approaching Twenty Years of Knowledge Tracing: Lessons Learned, Open Challenges, and Promising Developments, 122-129. Institute of Education, London, UK.
44. Xu, Y., Chang, K.-m., Yuan, Y., & Mostow, J. (2014, June 5-6). *EEG Helps Knowledge Tracing!* In Proceedings of the ITS2014 Workshop on Utilizing EEG Input in Intelligent Tutoring Systems, 43-48. Honolulu.
45. Yuan, Y., Chang, K.-m., Xu, Y., & Mostow, J. (2014, June 5-6). *A Public Toolkit and ITS Dataset for EEG*. In Proceedings of the ITS2014 Workshop on Utilizing EEG Input in Intelligent Tutoring Systems, 49-54. Honolulu.
46. Yuan, Y., Chang, K.-m., Taylor, J. N., & Mostow, J. (2014, March 24-28). *Toward Unobtrusive Measurement of Reading Comprehension Using Low-Cost EEG*. In 4th International Conference on Learning Analytics and Knowledge 54-58. Indianapolis, IN, USA.

47. Lallé, S., Mostow, J., Luengo, V., & Guin, N. (2013, July 9-13). *Comparing Student Models in Different Formalisms by Predicting their Impact on Help Success [Finalist for Best Paper Award]*. In Proceedings of the 16th International Conference on Artificial Intelligence in Education, 161-170. Memphis, TN.
48. González-Brenes, J. P. & Mostow, J. (2013, July 6-9). *What and when do students learn? Fully data-driven joint estimation of cognitive and student models*. In Proceedings of the 6th International Conference on Educational Data Mining, 236-239. Memphis, TN.
49. Xu, Y. & Mostow, J. (2013, July 6-9). *Using item response theory to refine knowledge tracing*. In Proceedings of the 6th International Conference on Educational Data Mining, 356-357. Memphis, TN.
50. Xu, Y. & Mostow, J. (2012, Dec. 8). *A Dynamic Higher-Order DINA Model To Trace Multiple Skills [oral presentation]*. In NIPS 2012 Workshop on Personalizing Education With Machine Learning, Lake Tahoe, CA. <http://www.cs.colorado.edu/~mozer/Admin/PersonalizingEducationNIPS2012/abstracts/Xu.pdf>
51. Mostow, J., Nelson, J., Kantorzyk, M., Gates, D., & Valeri, J. (2012, July 11-14). *How does the amount of context in which words are practiced affect fluency growth? Experimental results*. Talk presented at the Nineteenth Annual Meeting of the Society for the Scientific Study of Reading, Montreal, Canada.
52. Xu, Y., & Mostow, J. (2012, June 19-21). *Comparison of methods to trace multiple subskills: Is LR-DBN best? [Best Student Paper Award]*. In Proceedings of the Fifth International Conference on Educational Data Mining, Chania, Crete, Greece.
53. González-Brenes, J. P., & Mostow, J. (2012, June 19-21). *Dynamic Cognitive Tracing: Towards Unified Discovery of Student and Cognitive Models*. In Proceedings of the Fifth International Conference on Educational Data Mining, Chania, Crete, Greece.
54. Mostow, J., & Jang, H. (2012, June 7). *Generating Diagnostic Multiple Choice Comprehension Cloze Questions*. In NAACL-HLT 7th Workshop on Innovative Use of NLP for Building Educational Applications, Montréal, Canada.
55. Mostow, J. (2012, June 6-8). *Why and How Our Automated Reading Tutor Listens*. In International Symposium on Automatic Detection of Errors in Pronunciation Training (ISADEPT), 43-52. KTH, Stockholm, Sweden.
56. Chen, Y.-N., Chang, K.-M., & Mostow, J. (2012, June 3-8). *Towards Using EEG to Improve ASR Accuracy*. In The 2012 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL), Montréal, Canada
57. Sitaram, S., & Mostow, J. (2012, May 23-25). *Mining Data from Project LISTEN's Reading Tutor to Analyze Development of Children's Oral Reading Prosody [Best Paper Award]*. In Proceedings of the 25th Florida Artificial Intelligence Research Society Conference (FLAIRS-25), Marco Island, Florida.
58. Li, Y., & Mostow, J. (2012, May 23-25). *Evaluating and improving real-time tracking of children's oral reading*. In Proceedings of the 25th Florida Artificial Intelligence Research Society Conference (FLAIRS-25), Marco Island, Florida.
59. Xu, Y., & Mostow, J. (2012, May 23-25). *Extending a Dynamic Bayes Net Toolkit to Trace Multiple Subskills*. In Proceedings of the 25th Florida Artificial Intelligence Research Society Conference (FLAIRS-25), Marco Island, Florida.
60. Jang, H., & Mostow, J. (2012, April 23-27). *Inferring Selectional Preferences from Part-of-Speech N-grams*. In Proceedings of the 13th Conference of the European Chapter of the Association for Computational Linguistics, Avignon, France.
61. Chen, W., Mostow, J., & Aist, G. (2011, November 4-6). *Using Automatic Question Generation to Evaluate Questions Generated by Children*. Proceedings of the AAAI Symposium on Question Generation, Arlington, VA.

62. Duong, M., Mostow, J., & Sitaram, S. (2011). Two Methods for Assessing Oral Reading Prosody *ACM Transactions on Speech and Language Processing (Special Issue on Speech and Language Processing of Children's Speech for Child-machine Interaction Applications)*, 7(4), 14:11-22.
63. Gates, D., Aist, G., Mostow, J., Mckeown, M., & Bey, J. (2011, November 4-6). *How to Generate Cloze Questions from Definitions: a Syntactic Approach*. Proceedings of the AAI Symposium on Question Generation, Arlington, VA.
64. González-Brenes, J., Duan, W., & Mostow, J. (2011). *How to Classify Tutorial Dialogue? Comparing Feature Vectors vs. Sequences*. Proceedings of the 4th International Conference on Educational Data Mining Retrieved from <http://educationaldatamining.org/EDM2011/>
65. González-Brenes, J. P., & Mostow, J. (2011b, June 17-18). *What System Differences Matter? Using L1/L2 Regularization to Compare Dialogue Systems [Best Paper Nominee]*. Paper presented at the SIGDial: 12th annual SIGdial Meeting on Discourse and Dialogue, Portland, OR.
66. Chen, W., & Mostow, J. (2011, August 28-31). *A Tale of Two Tasks: Detecting Children's Off-Task Speech in a Reading Tutor*. Proceedings of the 12th Annual Conference of the International Speech Communication Association, Florence, Italy.
67. Mostow, J., Chang, K.-m., & Nelson, J. (2011, June 28 - July 2). *Toward Exploiting EEG Input in a Reading Tutor [Best Paper Nominee]*. Proceedings of the 15th International Conference on Artificial Intelligence in Education, Auckland, NZ.
68. Mostow, J., & Duan, W. (2011, June 24). *Generating Example Contexts to Illustrate a Target Word Sense*. Proceedings of the 6th Workshop on Innovative Use of NLP for Building Educational Applications, Portland, OR.
69. Mostow, J., González-Brenes, J., & Tan, B. H. (2011). *Learning Classifiers from a Relational Database of Tutor Logs*. Proceedings of the 4th International Conference on Educational Data Mining Retrieved from <http://educationaldatamining.org/EDM2011/>
70. Mostow, J., & Sitaram, S. (2011, July). *Mining data from Project LISTEN's Reading Tutor to analyze development of children's oral reading prosody*. Paper presented at the Eighteenth Annual Meeting of the Society for the Scientific Study of Reading.
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73. Sitaram, S., Mostow, J., Li, Y., Weinstein, A., Yen, D., & Valeri, J. (2011, August 24-26). *What visual feedback should a reading tutor give children on their oral reading prosody?* Proceedings of the SLATE: ISCA (International Speech Communication Association) Special Interest Group (SIG) Workshop on Speech and Language Technology in Education, Venice, Italy.
74. Xu, Y., & Mostow, J. (2011a, July 6-8). *Logistic Regression in a Dynamic Bayes Net Models Multiple Subskills Better! [Best Poster Nominee]*. Proceedings of the 4th International Conference on Educational Data Mining Eindhoven, Netherlands.
75. Xu, Y., & Mostow, J. (2011b, July 6-8). *Using Logistic Regression to Trace Multiple Subskills in a Dynamic Bayes Net*. Proceedings of the 4th International Conference on Educational Data Mining Eindhoven, Netherlands.
76. Duong, M., & Mostow, J. (2010, Sept. 26-30). *Adapting a Duration Synthesis Model to Score Children's Oral Reading*. Interspeech 2010, Makuhari, Japan, 769-772.

77. Chen, W., Mostow, J., & Aist, G. (2010, June 14-18). *Exploiting Predictable Response Training to Improve Automatic Recognition of Children's Spoken Questions*. Proceedings of the Tenth International Conference on Intelligent Tutoring Systems (ITS2010), Pittsburgh, PA, 55-64. © Springer-Verlag.
78. Mostow, J., Aist, G., Bey, J., Chen, W., Corbett, A., Duan, W., Duke, N., Duong, M., Gates, D., Gonzalez, J. P., Juarez, O., Kantorzyk, M., Li, Y., Liu, L., McKeown, M., Trotochaud, C., Valeri, J., Weinstein, A., & Yen, D. (2010, June 14-18). *A Better Reading Tutor That Listens [Interactive Event]*. Proceedings of the Tenth International Conference on Intelligent Tutoring Systems (ITS2010), Pittsburgh, PA, 451.
79. González-Brenes, J. P., & Mostow, J. (2010, June 11-13). *Predicting Task Completion from Rich but Scarce Data*. Proceedings of the 3rd International Conference on Educational Data Mining, Pittsburgh, PA, 291-292.
80. Mostow, J., & Tan, B. H. L. (2010, June 11-13). *AutoJoin: Generalizing an Example into an EDM query*. The Third International Conference on Educational Data Mining, Pittsburgh, PA, 307-308.
81. Aist, G., Gates, D., McKeown, M., & Mostow, J. (2010, January 8). *Derivational morphology affects children's word reading in English earlier than previously thought*. Presented at Linguistic Society of America (LSA) Annual Meeting, Baltimore, MD.
82. Aist, G., & Mostow, J. (2009, September 6-10). *Designing Spoken Tutorial Dialogue with Children to Elicit Predictable but Educationally Valuable Responses*. 10th Annual Conference of the International Speech Communication Association (Interspeech), Brighton, UK.
83. Aist, G., & Mostow, J. (2009, September 3-5). *Predictable and Educational Spoken Dialogues: Pilot Results*. Second ISCA Workshop on Speech and Language Technology in Education (SLaTE), Wroxall Abbey Estate, Warwickshire, England.
84. Duong, M., & Mostow, J. (2009, September 3-5). *Detecting Prosody Improvement in Oral Rereading*. Second ISCA Workshop on Speech and Language Technology in Education (SLaTE), Wroxall Abbey Estate, Warwickshire, England.
85. Liu, L., Mostow, J., & Aist, G. (2009, September 3-5). *Automated Generation of Example Contexts for Helping Children Learn Vocabulary*. Second ISCA Workshop on Speech and Language Technology in Education (SLaTE), Wroxall Abbey Estate, Warwickshire, England.
86. Mostow, J., & Duong, M. (2009, July 6-10). *Automated Assessment of Oral Reading Prosody*. Proceedings of the 14th International Conference on Artificial Intelligence in Education (AIED2009), Brighton, UK, 189-196.
87. Mostow, J., & Chen, W. (2009, July 6-10). *Generating Instruction Automatically for the Reading Strategy of Self-Questioning*. Proceedings of the 14th International Conference on Artificial Intelligence in Education (AIED2009), Brighton, UK, 465-472.
88. Chen, W., Aist, G., & Mostow, J. (2009, July 6). *Generating Questions Automatically from Informational Text*. Proceedings of AIED 2009 Workshop on Question Generation, Brighton, UK, 17-24.
89. Mostow, J., & Beck, J. E. (2009, July 1-3). *Why, What, and How to Log? Lessons from LISTEN*. Proceedings of the Second International Conference on Educational Data Mining, Córdoba, Spain, 269-278.
90. Liu, L., Aist, G., & Mostow, J. (2009, May 2-3). *Generating Example Contexts for Vocabulary Words: Initial Steps*. Sixth Midwest Computational Linguistics Colloquium, Bloomington, Indiana.
91. Mills-Tetley, A., Mostow, J., Dias, M. B., Sweet, T. M., Belousov, S. M., Dias, M. F., & Gong, H. (2009, April 17-19). *Improving Child Literacy in Africa: Experiments with an Automated Reading Tutor*. **Honorable Mention for Student Paper Award**. 3rd IEEE/ACM International Conference on Information and Communication Technologies and Development (ICTD2009), Carnegie Mellon, Doha, Qatar.
92. Corbett, A. & Mostow, J. (2008, September 25-26). *Automating Comprehension Questions: Lessons from a Reading Tutor*. In Proceedings of the 1st Workshop on Question Generation, NSF, Arlington, VA.

93. Beck, J. E., Chang, K.-m., Mostow, J., & Corbett, A. (2008, June 23-27). *Does help help? Introducing the Bayesian Evaluation and Assessment methodology*. 9th International Conference on Intelligent Tutoring Systems, Montreal, 383-394. **ITS2008 Best Paper Award.**
94. Beck, J. E., & Mostow, J. (2008, June 23-27). *How who should practice: Using learning decomposition to evaluate the efficacy of different types of practice for different types of students*. 9th International Conference on Intelligent Tutoring Systems, Montreal, 353-362. **Nominated for ITS2008 Best Paper.**
95. Zhang, X., Mostow, J., & Beck, J. E. (2008). *A Case Study Empirical Comparison of Three Methods to Evaluate Tutorial Behaviors*. 9th International Conference on Intelligent Tutoring Systems, Montreal, 122-131.
96. Zhang, X., Mostow, J., Duke, N. K., Trotochaud, C., Valeri, J., & Corbett, A. (2008, June 20-21). *Mining Free-form Spoken Responses to Tutor Prompts*. Proceedings of the First International Conference on Educational Data Mining, Montreal, 234-241.
97. Mostow, J., & Zhang, X. (2008, June 20-21). *Analytic Comparison of Three Methods to Evaluate Tutorial Behaviors*. Proceedings of the First International Conference on Educational Data Mining, Montreal, 28-37.
98. Xu, L., Varadharajan, V., Maravich, J., Tongia, R., & Mostow, J. (2007, October 1-3). DeSIGN: An Intelligent Tutor to Teach American Sign Language. SLATE workshop on Speech and Language Technology for Education, ISCA Tutorial and Research Workshop, The Summit Inn, Farmington, Pennsylvania.
99. Zhang, X., Mostow, J., & Beck, J. E. (2007, July 9-13). *Can a Computer Listen for Fluctuations in Reading Comprehension?* Proceedings of the 13th International Conference on Artificial Intelligence in Education, Los Angeles, CA, 495-502.
100. Zhang, X., Mostow, J., & Beck, J. E. (2007, July 9). All in the (word) family: Using learning decomposition to estimate transfer between skills in a Reading Tutor that listens. *AIED2007 Educational Data Mining Workshop*, Marina del Rey, CA.
101. Mostow, J. (2006, September 17-21). Is ASR accurate enough for automated reading tutors, and how can we tell? *Proceedings of the Ninth International Conference on Spoken Language Processing (Interspeech 2006 – ICSLP)*, Special Session on Speech and Language in Education, Pittsburgh, PA, 837-840.
102. Heiner, C., Beck, J., & Mostow, J. (2006, June 26-30). Automated Vocabulary Instruction in a Reading Tutor. *Proceedings of the 8th International Conference on Intelligent Tutoring Systems*, Jhongli, Taiwan, 741-743.
103. Chang, K.-m., Beck, J. E., Mostow, J., & Corbett, A. (2006, July 17). Does Help Help? A Bayes Net Approach to Modeling Tutor Interventions. *AAAI2006 Workshop on Educational Data Mining*, Boston, MA.
104. Chang, K.-m., Beck, J., Mostow, J., & Corbett, A. (2006, June 26-30). A Bayes Net Toolkit for Student Modeling in Intelligent Tutoring Systems. *Proceedings of the 8th International Conference on Intelligent Tutoring Systems*, Jhongli, Taiwan, 104-113.
105. Mostow, J., Beck, J., Cen, H., Gouvea, E., & Heiner, C. (2005, July). Interactive Demonstration of a Generic Tool to Browse Tutor-Student Interactions. *Interactive Events Proceedings of the 12th International Conference on Artificial Intelligence in Education (AIED 2005)*, Amsterdam, 29-32.
106. Mostow, J., Beck, J., Cuneo, A., Gouvea, E., & Heiner, C. (2005, July 18-22). A Generic Tool to Browse Tutor-Student Interactions: Time Will Tell! *Proceedings of the 12th International Conference on Artificial Intelligence in Education (AIED 2005)*, Amsterdam, 884-886.
107. Heiner, C., Beck, J., & Mostow, J. (2005, July 18-22). When do students interrupt help? Effects of individual differences. *Proceedings of the 12th International Conference on Artificial Intelligence in Education (AIED 2005)*, Amsterdam, 819-826.
108. Beck, J. E., Chang, K., Mostow, J., & Corbett, A. (2005, July 19). Using a student model to improve a computer tutor's speech recognition. *Proceedings of the AIED 05 Workshop on Student Modeling for Language Tutors*, 12th International Conference on Artificial Intelligence in Education, Amsterdam, 2-11.

109. Chang, K., Beck, J. E., Mostow, J., & Corbett, A. (2005, July 19). Using speech recognition to evaluate two student models for a reading tutor. *Proceedings of the AIED 05 Workshop on Student Modeling for Language Tutors*, 12th International Conference on Artificial Intelligence in Education, Amsterdam, 12-21.
110. Mostow, J., Beck, J., Cen, H., Cuneo, A., Gouvea, E., & Heiner, C. (2005, July 10). An Educational Data Mining Tool to Browse Tutor-Student Interactions: Time Will Tell! *Proceedings of the Workshop on Educational Data Mining*, National Conference on Artificial Intelligence, Pittsburgh, 15-22.
111. Beck, J. E., & Mostow, J. (2005, April 12). Mining Data from Randomized Within-Subject Experiments in an Automated Reading Tutor (poster in session 34.080, "Logging Students' Learning in Complex Domains: Empirical Considerations and Technological Solutions"). American Educational Research Association 2005 Annual Meeting: Demography and Democracy in the Era of Accountability, Montreal, Canada.
112. Beck, J. E., Mostow, J., & Bey, J. (2004, September 1-3). Can automated questions scaffold children's reading comprehension? *Proceedings of the 7th International Conference on Intelligent Tutoring Systems*, Maceio, Brazil.
113. Mostow, J. (2004, August 30). Some useful design tactics for mining ITS data. *ITS2004 Workshop on Analyzing Student-Tutor Interaction Logs to Improve Educational Outcomes*, Maceió, Alagoas, Brazil, 20-28.
114. Heiner, C., Beck, J., & Mostow, J. (2004, August 30). Lessons on Using ITS Data to Answer Educational Research Questions. *Proceedings of the ITS2004 Workshop on Analyzing Student-Tutor Interaction Logs to Improve Educational Outcomes*, Maceio, Brazil, 1-9.
115. Heiner, C., Beck, J. E., & Mostow, J. (2004, June 17-19). Improving the Help Selection Policy in a Reading Tutor that Listens. *Proceedings of the InSTIL/ICALL Symposium on NLP and Speech Technologies in Advanced Language Learning Systems*, Venice, Italy, 195-198.
116. Beck, J. E., Sison, J., & Mostow, J. (2004, June 27-30). Using automated speech recognition to measure scaffolding and learning effects of word identification interventions in a computer tutor that listens. Eleventh Annual Meeting of the Society for the Scientific Study of Reading, Amsterdam, The Netherlands.
117. Banerjee, S., Mostow, J., Beck, J., & Tam, W. (2003, December 15-16). Improving Language Models by Learning from Speech Recognition Errors in a Reading Tutor that Listens. *Second International Conference on Applied Artificial Intelligence*, Fort Panhala, Kolhapur, India.
118. Banerjee, S., Beck, J., & Mostow, J. (2003, September 1-4). Evaluating the Effect of Predicting Oral Reading Miscues. *Proc. 8th European Conference on Speech Communication and Technology (Eurospeech 2003)*, Geneva, Switzerland.
119. Tam, Y.-C., Beck, J., Mostow, J., & Banerjee, S. (2003, September 1-4). Training a Confidence Measure for a Reading Tutor that Listens. *Proc. 8th European Conference on Speech Communication and Technology (Eurospeech 2003)*, Geneva, Switzerland.
120. Mostow, J., & Beck, J. E. (2003, July 20-24). Project LISTEN's Reading Tutor: Interactive Event Description. *Supplemental Proceedings of the Tenth International Conference on Artificial Intelligence in Education (AIED2003)*, Sydney, Australia, 30-32.
121. Beck, J. E., Mostow, J., Cuneo, A., & Bey, J. (2003, July 20-24). Can automated questioning help children's reading comprehension? *Proceedings of the Tenth International Conference on Artificial Intelligence in Education (AIED2003)*, Sydney, Australia, 380-382.
122. Beck, J. E., Jia, P., Sison, J., & Mostow, J. (2003, June 22-26). Predicting student help-request behavior in an intelligent tutor for reading. *Proceedings of the 9th International Conference on User Modeling*, Johnstown, PA, 303-312.
123. Beck, J. E., Jia, P., & Mostow, J. (2003, June 22-26). Assessing student proficiency in a Reading Tutor that listens. *Proceedings of the 9th International Conference on User Modeling*, Johnstown, PA, 323-327.

124. Mostow, J., Beck, J. E., & Valeri, J. (2003, June 22). Can Automated Emotional Scaffolding Affect Student Persistence? A Baseline Experiment. *Proceedings of the Workshop on "Assessing and Adapting to User Attitudes and Affect: Why, When and How?" at the 9th International Conference on User Modeling (UM'03)*, Johnstown, PA, 61-64.
125. Mostow, J., Beck, J., Bey, J., Cuneo, A., Sison, J., & Tobin, B. (2003, June 12-15). An Embedded Experiment to Evaluate the Effectiveness of Vocabulary Previews in an Automated Reading Tutor. *Tenth Annual Meeting of the Society for Scientific Studies of Reading*, Boulder, CO.
126. Mostow, J., Beck, J., Chalasani, R., Cuneo, A., & Jia, P. (2002, October 14-16). Viewing and Analyzing Multimodal Human-computer Tutorial Dialogue: A Database Approach. Fourth IEEE International Conference on Multimodal Interfaces (ICMI 2002), Pittsburgh, PA. Revised version of paper first presented at *ITS 2002 Workshop on Empirical Methods for Tutorial Dialogue Systems*, San Sebastian, Spain.
127. Mostow, J., Beck, J., Winter, S. V., Wang, S., & Tobin, B. (2002, September 16-20). Predicting oral reading miscues. *Seventh International Conference on Spoken Language Processing (ICSLP-02)*, Denver, CO.
128. Mostow, J., Aist, G., Bey, J., Burkhead, P., Cuneo, A., Junker, B., Rossbach, S., Tobin, B., Valeri, J., & Wilson, S. (2002, June 27-30). Independent practice versus computer-guided oral reading: Equal-time comparison of sustained silent reading to an automated reading tutor that listens. *Ninth Annual Meeting of the Society for the Scientific Study of Reading*, Chicago, IL.
129. Mostow, J., Aist, G., Beck, J., Chalasani, R., Cuneo, A., Jia, P., & Kadaru, K. (2002, June 5-7). A La Recherche du Temps Perdu , or As Time Goes By: Where does the time go in a Reading Tutor that listens? *Sixth International Conference on Intelligent Tutoring Systems (ITS'2002)*, Biarritz, France.
130. Aist, G., Kort, B., Reilly, R., Mostow, J., & Picard, R. (2002, June 5-7). Adding Human-Provided Emotional Scaffolding to an Automated Reading Tutor that Listens Increases Student Persistence [Poster]. *Sixth International Conference on Intelligent Tutoring Systems (ITS'2002)*, Biarritz, France.
131. Aist, G., Kort, B., Reilly, R., Mostow, J., & Picard, R. (2002, June 4). Experimentally Augmenting an Intelligent Tutoring System with Human-Supplied Capabilities: Adding Human-Provided Emotional Scaffolding to an Automated Reading Tutor that Listens. *ITS 2002 Workshop on Empirical Methods for Tutorial Dialogue Systems*, San Sebastian, Spain.
132. Mostow, J., Beck, J., Chalasani, R., Cuneo, A., & Jia, P. (2002, June 4). Viewing and Analyzing Multimodal Human-computer Tutorial Dialogue: A Database Approach. *ITS 2002 Workshop on Empirical Methods for Tutorial Dialogue Systems*, San Sebastian, Spain.
133. Mostow, J., Tobin, B., & Cuneo, A. (2002, June 3). Automated Comprehension Assessment in a Reading Tutor. *ITS 2002 Workshop on Creating Valid Diagnostic Assessments*, San Sebastian, Spain, pp. 52-63.
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## Other Publications

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## Patents and Invention Disclosures

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## Software Artifacts

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## Video Productions

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## Television Interviews (about Project LISTEN)

- CTV (2006, March 16). Interview with Ken Reeder on the Vancouver Reading Tutor Project (3m28s). *CTV News*. Canada. (Note: independent news story about using the Reading Tutor in research at UBC.)
- Han, C. (2004, January 7). Cover Story: A high-tech teacher comes to area schools (7m26s). On *OnQ Magazine*. Pittsburgh, PA: WQED. Rebroadcast February 2005.
- Frey, K. (2003, October 17). CMU's Automated Reading Tutor Helps Children (2m16s). On *Evening News*. Pittsburgh, PA: WTAE. Available at [www.cs.cmu.edu/~listen](http://www.cs.cmu.edu/~listen).
- Doyle, M., & Koch, D. (2003, July 23). Live interview with Jack Mostow (4m30s). On *Sunrise* [morning television show]. Sydney, Australia: Channel Seven. Available at [www.cs.cmu.edu/~listen](http://www.cs.cmu.edu/~listen).
- Rubin, J. (2002). The Sounds of Speech (Show 3). On *Reading Rockets* (Public Television series commissioned by U.S. Department of Education). Washington, DC: WETA. Contains 3-minute segment on Project LISTEN, available at [www.cs.cmu.edu/~listen](http://www.cs.cmu.edu/~listen).

## Additional Presentations (on Project LISTEN)

- 2014 Keynote (in French), Information Technology and Communication for Education Conference, Béziers, France
- 2014 Featured speaker, Ohio Educational Technology Conference, Columbus, OH
- 2013 Keynote, 16th International Conference on Artificial Intelligence in Education, Memphis, TN
- 2013 Invited talk, Early Education and Technology for Children Conference, Salt Lake City, UT
- 2013 Invited talk, Texas A&M University
- 2013 Invited talk, Northern Illinois University
- 2013 Invited panel on Educational Data Mining and Learning Analytics at the Computing Research Association Workshop on Multidisciplinary Research for Online Education, Washington, DC
- 2012 Computer Science colloquium, Hebrew University, Jerusalem, Israel
- 2012 Keynote, International Symposium on Automatic Pronunciation Error Detection, Stockholm, Sweden
- 2012 Invited talk at the Workshop on Optimal Teaching, UCSD Temporal Dynamics of Learning Center
- 2011 Keynote on *Questions and Answers about Questions and Answers: Lessons from generating, scoring, and analyzing questions in a Reading Tutor for children*, AAAI Question Generation Symposium, Arlington, VA
- 2011 *What Are We Learning about Reading from Studies in Labs, a Reading Tutor that Listens, and People at Schools?*, Annual Conference of the International Association of Laboratory and University Affiliated Schools (NALS), Pittsburgh, PA
- 2011 *What can we learn from an automated Reading Tutor that listens?*, Allegheny Intermediate Unit meeting on Research on Vocabulary Learning, Learning Research and Development Center, Univ. of Pittsburgh
- 2010 *Reading Tutor Evaluation Approaches: Redefining, Evaluating, (Visualizing), and Improving the Reading Tutor's Tracking Accuracy*. Speech Group lunch talk. With Morten Rasmussen
- 2009 *How often are prefixes useful cues to word meaning? Less than you might think!* PSLC lunch talk
- 2009 *How often are prefixes useful cues to word meaning? Less than you might think!* Sixteenth Annual Meeting of the Society for the Scientific Study of Reading, Boston. With Greg Aist
- 2009 *Does fluency growth transfer among related words? Longitudinal evidence from Project LISTEN's Reading Tutor*. Cognitive Modeling Seminar, Psychology Department
- 2008 Analytic Comparison of Three Methods to Evaluate Tutorial Behaviors. PIER EdBag seminar
- 2008 A Reading Tutor that Listens. Talk for summer Andrew's Leap program at Carnegie Mellon.
- 2008 Mostow, J., Beck, J., Zhang, X., & Leszczenski, J. *Does fluency growth transfer among related words? Longitudinal evidence from Project LISTEN's Reading Tutor*. Fifteenth Annual Meeting Society for the Scientific Study of Reading, Asheville, NC
- 2008 Embedding Experiments in a Reading Tutor that listens. Guest lecture, Research Methods course
- 2008 What can we learn from a Reading Tutor that listens? Computer Science Department seminar, Brandeis
- 2008 What can we learn from a Reading Tutor that listens? Brain and Behavior Center, University of Haifa
- 2007 (Invited speaker): How Can We Learn from a Reading Tutor that Listens? NSF brownbag panel on IERI. Washington, DC
- 2007 What can we learn from a Reading Tutor that listens? Keynote at Symposium on Virtual Communication Support, Leuven, Belgium
- 2006 Scaling up via Academic-Commercial Partnership: *A Tale of Two Tutors*. Annual Meeting of Interagency Education Research Initiative (IERI) Principal Investigators

- 2006 *Refined micro-analysis of fluency gains in a Reading Tutor that listens.* Thirteenth Annual Meeting of the Society for the Scientific Study of Reading, Vancouver, BC
- 2006 A Reading Tutor that Listens. Pennsylvania Educational Technology Exposition & Conference (PETE&C) in Hershey, PA
- 2005 (Invited organizer and speaker): Educational Data Mining Success Stories. Panel on Data Mining and Analysis. Annual Meeting of Interagency Education Research Initiative (IERI) Principal Investigators. Washington, DC
- 2005 A Reading Tutor that Listens. Talk for summer Andrew's Leap program at Carnegie Mellon.
- 2005 Micro-analysis of fluency gains in a Reading Tutor that listens: Wide vs. repeated guided oral reading. Twelfth Annual Meeting of the Society for the Scientific Study of Reading. Toronto
- 2005 Mining Data from Randomized Within-Subject Experiments in an Automated Reading Tutor. Poster at AERA panel on "Logging Students' Learning in Complex Domains: Empirical Considerations and Technological Solutions."
- 2005 A Reading Tutor that Listens. Pennsylvania Training and Technical Assistance Network, PA Department of Education. Harrisburg, PA
- 2004 Experimenter-defined measures in a Reading Tutor that listens. IERI Principal Investigator Meeting,
- 2004 *If I Have a Hammer: Computational Linguistics in a Reading Tutor that Listens.* Keynote address at 42<sup>nd</sup> Annual Meeting of the Association of Computational Linguistics, Barcelona, Spain.
- 2004 *Which Help Helps? Effects of Various Types of Help on Word Learning in an Automated Reading Tutor that Listens.* Eleventh Annual Meeting of the Society for the Scientific Study of Reading, Amsterdam, NL
- 2004 Experimenter-defined measures in a Reading Tutor that Listens. IERI Principal Investigator Meeting
- 2004 A Reading Tutor that Listens. Robotics Institute staff lunch talk
- 2003 Invited talk at conference on *Conceptualizing Scale-Up: Multidisciplinary Perspectives*, Washington, DC
- 2003 Invited talk at Covenant House retirement community
- 2003 Guest lecture in course on ICT4B (Information Communication Technology for 4 Billion), taught jointly at Carnegie Mellon and UC Berkeley.
- 2002 Guest presentation at Prof. Rollanda O'Connor's graduate course on reading, University of Pittsburgh
- 2001 Workshop on "Bridging the Digital Divide for Work and Play," Toronto, Canada
- 2001 Workshop on "Facilitating Constructivist Literacy Environments through Technology," University of Nijmegen, the Netherlands
- 2001 Panel on "Looking Back 25 Years from Now: Key Developments in Conversational Systems," NAACL workshop on Adaptation in Dialogue Systems, Pittsburgh, PA
- 2001 Educational Technology Symposium, Carnegie Mellon University, Pittsburgh, PA
- 2001 CIRCLE Advisory Board meeting, Pittsburgh, PA
- 2000 Inter-agency Educational Research Initiative (IERI) Principal Investigators Meeting, Washington, DC
- 2000 Allegheny Intermediate Unit Superintendents' Conference, Dawson, PA
- 2000 Tutorial on Reading Tutor, U.S. Department of Education, Washington, DC
- 2000 Joint CIL-CIRCLE seminar, Pittsburgh, PA
- 2000 Language Technologies Institute Seminar, Pittsburgh, PA
- 1999 IERI Principal Investigators Meeting, Washington, DC
- 1999 Chair, Harvard-Radcliffe 25th Reunion Panel on "Science and Medicine Near the Millennium"

- 1999 Advisory panel on technology, U.S. Department of Education, Washington, DC
- 1999 Learning and Intelligent Systems PI Meeting, National Science Foundation, Washington, DC
- 1999 Institute for Learning, Pittsburgh, PA
- 1998 Coalition for National Science Funding (CNSF), Washington, DC (demo selected to represent Computing Research Association)
- 1997 Defense Evaluation Research Administration (DERA), Malvern, England
- 1997 Ninth National Conference on Innovative Applications of Artificial Intelligence (IAAI-97), Providence, RI (invited survey of Artificial Intelligence and Education)
- 1997 DARPA CAETI Community Meeting, Fairfax, VA (hands-on demos)
- 1997 Forum on Interactive Technology and Software Development, U.S. Department of Education
- 1997 Robotics Institute and Center for Innovation in Learning, Carnegie Mellon University
- 1996 DARPA CAETI Community Meeting, Berkeley, CA
- 1996 First CMU Symposium on Technology Enhanced Learning (TEL), Pittsburgh, PA (demo)
- 1996 Ernest L. Boyer Technology Summits for Educators, Pittsburgh, PA
- 1996 Schenley High Technology Magnet Conference for Pittsburgh area high school students (demo)
- 1995 CMU computer science graduate course on speech processing (guest lecture and demo)
- 1995 DoDEA/CAETI Technology Brainstorm Session to develop initial plans for using technology for language arts/reading curriculum development, Alexandria, VA
- 1995 Eighth Annual Symposium on User Interface Software and Technology (UIST'95). Sponsored by ACM SIGGRAPH and SIGCHI with SIGSOFT, Pittsburgh, PA (refereed demonstration)
- 1995 Colloquium, Center for Language and Speech Processing, Johns Hopkins University, Baltimore, MD
- 1995 DoD Technology Review: Speech Recognition for Language Sustainment, Fayetteville, NC
- 1995 "Basic Research in the National Defense: University Contributions to Preparedness," sponsored by the American Association of Universities, Washington, DC (demo)
- 1995 Fourth International Workshop on Human & Machine Cognition: "Smart Machines in Education & Training: Perils and Promise," Seaside, FL
- 1994 7th Annual Adult Literacy & Technology Conference, Atlanta, GA
- 1994 Careers in Applied Science and Technology program (high school students and teachers)
- 1994 National Science Foundation Project Directors' Meeting, Applications of Advanced Technology Program, Washington, DC (presentation and hands-on demo)
- 1994 NATO RSG-10 Speech Study Section, CMU (hands-on demo)
- 1994 CMU Electrical and Computer Engineering Graduate Seminar
- 1994 Schenley High Technology Magnet Conference for Pittsburgh area high school students (demo)
- 1994 CMU computer science graduate course on speech processing (guest lecture)
- 1994 ARPA Workshop on Human Language Technology, Princeton, NJ (demo)
- 1994 University of Pittsburgh Learning Research and Development Center
- 1994 CMU Human-Computer Interaction Seminar
- 1993 Harvard University Center for Research in Computing Technology, Cambridge, MA
- 1993 CMU Robotics Institute Seminar
- 1993 Project Directors' Meeting, NSF Applications of Advanced Technology Program, Washington, DC

## TEACHING

### Courses Taught at Carnegie Mellon

- 1992 – Guest lectures in graduate Speech, Human-Computer Interaction, Writing, and high school programs
- 1976 “Computer Science 15-104: Introduction to Computing” (section instructor)

### Courses Taught Elsewhere

- 1985-92 “CS111: Introduction to Computer Science” (Faculty Supervisor starting Fall 1989), Rutgers University
- 1988 “CS671: Knowledge Compilation,” graduate seminar jointly created and taught with Prof. Christopher Tong, Rutgers University Computer Science Department
- 1987 “CS531: Artificial Intelligence Software Techniques and Languages,” Rutgers University
- 1987 “Artificial Intelligence and Design,” four-hour tutorial, including 90-page syllabus, jointly created and presented with Prof. Tom Mitchell at the Sixth National Conference on Artificial Intelligence, Seattle
- 1986 “CS671: Artificial Intelligence Approaches to Design,” graduate seminar jointly created and taught with Profs. Louis Steinberg and Christopher Tong, Rutgers University Computer Science Department
- 1986-92 “CS536: Machine Learning,” Rutgers University Computer Science Department
- 1985 “Artificial Intelligence Programming,” three-week intensive graduate-level course jointly created and taught with Prof. Louis Steinberg at the Institute of Artificial Intelligence, Claremont, CA

## SERVICE

### Service and Committee Work at Carnegie Mellon

- 2004 – Steering Committee, [Program for Interdisciplinary Educational Research \(PIER\)](#)
- 2005–6 Program Committee, 50<sup>th</sup> Anniversary of School of Computer Science
- 2004–06 Admissions Committee, Robotics PhD program
- 2004–06 Coordinator, Artificial Intelligence Seminar Series
- 1998 School of Computer Science Self-Assessment Committee
- 1993–97 University Research Council
- 1993–95 Faculty Senate

### Service and Committee Work elsewhere

- 2010–11 Board member, Pittsburgh Savoyards
- 1990–92 Fellow of Douglass College, Rutgers University
- 1989–92 Faculty Supervisor for “CS111: Introduction to Computer Science”, Rutgers University
- 1987–89 Computer Science Department Colloquium Coordinator, Rutgers University
- 1987–91 Computer Science Department Elections Committee, Rutgers University
- 1986–91 Computer Science Department Graduate Admissions Committee, Rutgers University

## AVOCATIONS

- 1970 – Operatic roles in Pittsburgh Savoyards and at Rutgers, Carnegie Mellon, Stanford, and Harvard
- 1973 – Cantorial soloist in MA, PA, CA, NJ, CT, SC, and Israel
- 1970 – Bicycling across the United States, in Europe, and around the neighborhood