

## Curriculum Vitae

Jeffrey Mark Siskind

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Monday 8 October 2018

### Education

#### **Technion, Israel Institute of Technology**

B.A. *cum laude* in computer science, November 1979

#### **Massachusetts Institute of Technology**

S. M. in computer science, January 1989

Thesis title: The Culprit Pointer Method for Selective Backtracking

Advisor: David A. McAllester

#### **Massachusetts Institute of Technology**

Ph.D. in computer science, February 1992

Thesis title: Naive Physics, Event Perception, Lexical Semantics, and Language Acquisition

Advisor: Robert C. Berwick

### Academic Employment

#### **Weizmann Institute of Science**

July 1974–February 1975

*Researcher, Chemical Physics Department*

**Rehovot, Israel**

#### **MIT Lincoln Laboratory**

March 1980–August 1982

*Staff Member, Digital Integrated Circuits Group and Speech Systems Technology Group*

**Lexington, Massachusetts**

#### **Xerox PARC**

June–September 1987

February 1988

June–August 1988

July–September 1989

December 1989–January 1990

*Research Intern, System Sciences Laboratory*

**Palo Alto, California**

#### **University of Pennsylvania**

February 1992–July 1993

*Postdoctoral Fellow, Institute for Research in Cognitive Science*

**Philadelphia, Pennsylvania**

#### **University of Toronto**

August 1993–December 1995

*Assistant Professor, Department of Computer Science*

**Toronto, Ontario**

#### **Technion, Israel Institute of Technology**

February–August 1996

*Senior Lecturer, Department of Electrical Engineering*

**Haifa, Israel**

#### **University of Vermont**

September 1996–May 1997

*Visiting Assistant Professor, Department of Computer Science and Electrical Engineering*

**Burlington, Vermont**

**NEC Research Institute**  
June 1997–December 2001  
*Research Scientist, Computer Science Division*

**Princeton, New Jersey**

**Purdue University**  
January 2002–present  
*Associate Professor, School of Electrical and Computer Engineering*  
September 2003–present  
*Affiliate, Linguistics Program*  
September 2009–present  
*Courtesy Appointment, Department of Computer Science*  
September 2016–present  
*Courtesy Appointment, Department of Speech, Language, and Hearing Sciences*

**West Lafayette, Indiana**

### Industrial Employment

**MetaLogic, Inc.**  
April 1982–August 1985  
*Founder, Chairman, Treasurer, Vice President, and CTO*

**Cambridge, Massachusetts**

Founded MetaLogic to commercialize the MACPITTS technology developed at MIT. Acting as CEO for the first year, wrote business plan and negotiated contracts with venture capital firms that successfully raised \$1.5 million. Set up corporate infrastructure, which included: planning, supervising construction, and furnishing of office space; financing, purchase, and installation of computer facilities; establishing relationships with legal and accounting firms; and growing the staff to a total of ten people. As CTO, managed a technical staff of five through the development and delivery of METASYN, a complex digital integrated circuit design automation system comprising over 50,000 lines of LISP code as well as a large nMOS cell library. Was an active participant in, and major contributor to, that design and implementation effort. Supervised successful completion and installation of the product at customers' facilities, resulting in the design of over a dozen fabricated nMOS ICs, all of which proved fully functional at first silicon. Actively participated in the marketing effort which included preparation of sales literature, giving presentations to potential customers, performing in-the-field market research, formulating product strategy, and organizing and giving trade show presentations.

**Ontologic, Inc.**  
January–May 1987  
*Consultant*

**Billerica, Massachusetts**

Performed consulting services pertaining to the design of a persistent object-oriented database for representing VLSI designs.

**International Systems Services Company**  
June 1987  
*Consultant*

**New York, New York**

Performed consulting services pertaining to automatic test vector generation from high-level behavioral descriptions of digital systems.

**Chestnut Software**  
June–August 1990  
*Consultant*

**Boston, Massachusetts**

Performed consulting services pertaining to the design and implementation of a natural-language front end for database applications.

## Grants Received

### **1994**

J.M. Siskind, PI, 'Computational Models of Lexical Acquisition and Visual Event Perception,' NSERC operating grant, April 1994–April 1997, \$48,000 (Canadian).

### **1996**

J.M. Siskind, PI, C. Colbourn, co-PI, and R. Snapp, co-PI, 'A Computer Facility to Support Compute-Intensive Research,' University of Vermont Research Advisory Council, November 1996, \$7,497, my share \$7,497.

### **2001**

J.M. Siskind, co-PI, and R.L. Givan, co-PI, 'Learning Program Behaviors using Temporal Event Logic,' Center for Education and Research in Information Assurance and Security, September 2001–August 2002, \$50,000, my share \$30,698.59.

### **2002**

J.M. Siskind, PI, 'A World-Wide Distributed Repository to Support Fine-Grained Sharing of Source Code,' Cisco University Research Program, December 2002, \$83,400.

### **2003**

J.M. Siskind, PI, C.A. Bouman, co-PI, and I. Pollak, co-PI, 'Hierarchical Perceptual Organization with the Center-Surround Algorithm,' NSF award 0329156IIS, September 2003–August 2006, \$500,000, my share \$264,000. Robotics and Computer Vision, the program that funded this proposal, funded only 27 out of the 172 proposals submitted (16%) in 2003.

### **2004**

J.M. Siskind, PI, 'Stochastic Spatio-Temporal Grammars for Event Recognition in Video,' Honda Initiation Grant, November 2004, \$49,878. Only 5 out of the 125 proposals submitted (4%) were funded in this competition.

### **2005**

J.M. Siskind, PI, 'Algorithmic Differentiation of Functional Programs,' NSF award CCF-0438806, May 2005–April 2010, \$420,000. Science of Design, the program that funded this proposal, funded only 10% of the proposals submitted in this competition.

### **2010**

J.M. Siskind, PI, AWS research grant, Amazon.com, March 2010–February 2011, 3000 EC2 credits.

J.M. Siskind, PI, 'Emergent Intelligent Behavior through Integrated Investigation of Embodied Natural Language, Reasoning, Learning, Computer Vision, and Robotic Manipulation,' NRL contract N00173-10-1-G023 (DARPA seedling), July–November 2010, \$50,000.

J.M. Siskind, lead PI (subcontracts to S. Khan and H. Cheng, Sarnoff Corporation, S. Wang, University of South Carolina, and S. Dickinson, University of Toronto), 'Robust and Principled Visual Intelligence,' ARL cooperative agreement W911NF-10-2-0060 (DARPA Mind's Eye program), July 2010–March 2016, \$3,600,000.

### **2015**

J.M. Siskind, PI, 'NRI: Collaborative Research: RobotSLANG: Simultaneous Localization, Mapping, and Language Acquisition,' NSF award 1522954-IIS, September 2015–August 2019, \$650,000. This is in collaboration with Jason J. Corso of the University of Michigan, who received a separate award 1522904-IIS of \$650,000.

### **2017**

J.M. Siskind, PI, R.B. Wilbur, co-PI, and E. Malaia, co-PI, 'NCS-FO: Neuroimaging to Advance Computer Vision, NLP, and AI,' NSF award 1734938-IIS, August 2017–July 2020, \$1,000,000 (my share \$791,762). Part of the BRAIN initiative.

J.M. Siskind, PI, 'Purdue subcontract for the IBM proposal to IARPA DIVA,' contractor's reference number 00068728, 20 September 2017–19 September 2021, \$2,349,990. Prime contract: 'Intelligent Video Activity Detection and Recognition,' Department of Interior/Interior Business Center (DOI/IBC) contract number D17PC00341.

**2018**

J.M. Siskind, PI, ‘Natural Language Query Refinement Dialog for Video Search,’ Siemens Corporation, Corporate Technology, 1 July 2018–31 December 2018, \$124,960.

Honors**1986**

One of 25 annual nationwide recipients of a four year AT&T Ph.D. fellowship, 1986–1990.

**1992**

Nominated for the ACM Distinguished Dissertation Award.

**1993**

The George M. Sprowls Award for ‘Outstanding contribution in the field of Electronic Computer and Investigation Research by an EECS Student,’ Department of Electrical Engineering and Computer Science, MIT.

**1996**

The Louis and Miriam Benjamin Academic Lectureship, Department of Electrical Engineering, Technion.

**2013**

Best paper award, 51st Annual Meeting of the Association for Computational Linguistics (ACL).

**2015**

Paper published in senior member track, blue-sky ideas subtrack, Conference on Artificial Intelligence (AAAI).

Paper published in award winning papers track, Journal of Artificial Intelligence Research (JAIR).

Refereed Journal Publications

Citation counts in this and other sections are from Google Scholar on Tuesday 4 September 2018. Total citations: 4051 (h-index 31). Impact factors are from JCR (2016).

**1995**

J.M. Siskind, ‘Grounding Language in Perception,’ *Artificial Intelligence Review*, 8(5–6):371–391, 1995, impact factor 2.627, 107 citations.

<http://engineering.purdue.edu/~qobi/papers/aireview1995.pdf>

**1996**

J.M. Siskind, ‘A Computational Study of Cross-Situational Techniques for Learning Word-to-Meaning Mappings,’ *Cognition*, 61(1–2):39–91, October–November 1996, impact factor 3.414. Also appeared in *Computational Approaches to Language Acquisition*, M.R. Brent, ed., Elsevier, pp. 39–91, 1996, 546 citations.

<http://engineering.purdue.edu/~qobi/papers/cognition1996.pdf>

**1997**

R. Mann, A.D. Jepson, and J.M. Siskind, ‘The Computational Perception of Scene Dynamics,’ *Computer Vision and Image Understanding (CVIU)*, 65(2):113–128, February 1997, impact factor 2.498, 83 citations.

<http://engineering.purdue.edu/~qobi/papers/cviu1997.pdf>

**2001**

J.M. Siskind, ‘Grounding the Lexical Semantics of Verbs in Visual Perception Using Force Dynamics and Event Logic,’ *Journal of Artificial Intelligence Research (JAIR)*, 15:31–90, August 2001, impact factor 2.284. Also available as Technical Report 2000-105, NEC Research Institute, Inc., July 2000, 277 citations.

<http://engineering.purdue.edu/~qobi/papers/jair2001.pdf>

M.R. Brent and J.M. Siskind, ‘The Role of Exposure to Isolated Words in Early Vocabulary Development,’ *Cognition*, 81(2):B33–B44, September 2001, impact factor 3.414. Also available as Technical Report 99-107, NEC Research Institute, Inc., July 1999. Revised as Technical Report 2000-067R, NEC Research Institute, Inc., May 2000, 456 citations.

<http://engineering.purdue.edu/~qobi/papers/cognition2001.pdf>

**2002**

A.P. Fern, R.L. Givan, and J.M. Siskind, 'Specific-to-General Learning for Temporal Events with Application to Learning Event Definitions from Video,' *Journal of Artificial Intelligence Research (JAIR)*, 17:379–449, December 2002, impact factor 2.284, 59 citations.

<http://engineering.purdue.edu/~qobi/papers/jair2002.pdf>

**2003**

S. Wang and J.M. Siskind, 'Image Segmentation with Ratio Cut,' *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 25(6):675–690, June 2003, impact factor 8.329, 381 citations.

<http://engineering.purdue.edu/~qobi/papers/pami2003.pdf>

J.M. Siskind, 'Reconstructing Force-Dynamic Models from Video Sequences,' *Artificial Intelligence (AIJ)*, 151(1–2):91–154, December 2003, impact factor 4.797, 38 citations.

<http://engineering.purdue.edu/~qobi/papers/aij2003.pdf>

**2005**

S. Wang, T. Kubota, J.M. Siskind, and J. Wang, 'Salient Closed Boundary Extraction with Ratio Contour,' *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 27(4):546–561, April 2005, impact factor 8.329, 173 citations.

<http://engineering.purdue.edu/~qobi/papers/pami2005.pdf>

**2006**

W. Wang, I. Pollak, T.-S. Wong, C.A. Bouman, M.P. Harper, and J.M. Siskind, 'Hierarchal Stochastic Image Grammars for Classification and Segmentation,' *IEEE Transactions on Image Processing (TIP)*, 15(10):3033–3052, October 2006, impact factor 4.828, 44 citations.

<http://engineering.purdue.edu/~qobi/papers/tip2006.pdf>

**2007**

J.M. Siskind, J. Sherman, Jr., I. Pollak, M.P. Harper, and C.A. Bouman, 'Spatial Random Tree Grammars for Modeling Hierarchal Structure in Images with Regions of Arbitrary Shape,' *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 29(9):1504–1519, September 2007, impact factor 8.329, 25 citations.

<http://engineering.purdue.edu/~qobi/papers/pami2007.pdf>

**2008**

B.A. Pearlmutter and J.M. Siskind, 'Reverse-Mode AD in a Functional Framework: Lambda the Ultimate Backpropagator,' *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 30(2):1–36, March 2008, impact factor 3.033, 37 citations.

<http://engineering.purdue.edu/~qobi/papers/toplas2008.pdf>

J.M. Siskind and B.A. Pearlmutter, 'Nesting Forward-Mode AD in a Functional Framework,' *Higher-Order and Symbolic Computation (HOSC)*, 21(4):361–376 December 2008, 37 citations.

<http://engineering.purdue.edu/~qobi/papers/hosc2008.pdf>

**2012**

N. Siddharth, A. Barbu, and J.M. Siskind, 'Seeing Unseeability to See the Unseeable,' *Advances in Cognitive Systems (ACS)*, 2:77–94, December 2012, 1 citation.

<http://engineering.purdue.edu/~qobi/papers/acs2012a.pdf>

A. Barbu, N. Siddharth, A. Michaux, and J.M. Siskind, 'Simultaneous Object Detection, Tracking, and Event Recognition,' *Advances in Cognitive Systems (ACS)*, 2:203–220, December 2012, 25 citations.

<http://engineering.purdue.edu/~qobi/papers/acs2012b.pdf>

**2015**

H. Yu, N. Siddharth, A. Barbu, and J.M. Siskind, 'A Compositional Framework for Grounding Language Inference, Generation, and Acquisition in Video,' *Journal of Artificial Intelligence Research (JAIR)*, 52:601–713, April 2015, impact factor 2.284, **award winning papers track**, 23 citations.

<http://engineering.purdue.edu/~qobi/papers/jair2015.pdf>

## 2016

D.P. Barrett, A. Barbu, N. Siddharth, and J.M. Siskind, ‘Saying What You’re Looking For: Linguistics Meets Video Search,’ *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, 38(10):2069–2081, October 2016, impact factor 8.329, 5 citations.

<http://engineering.purdue.edu/~qobi/papers/pami2016.pdf>

D.P. Barrett, R. Xu, H. Yu, and J.M. Siskind, ‘Collecting and Annotating the Large Continuous Action Dataset,’ *Machine Vision and Applications (MVAP)*, 27(7):983–995, October 2016, impact factor 2.005, 2 citations.

<http://engineering.purdue.edu/~qobi/papers/mvap2016.pdf>

D.P. Barrett and J.M. Siskind, ‘Action Recognition by Time-Series of Retinotopic Appearance and Motion Features,’ *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, 26(12):2250–2263, December 2016, impact factor 3.599, 12 citations.

<http://engineering.purdue.edu/~qobi/papers/tcsvt2016.pdf>

## 2017

H. Yu and J.M. Siskind, ‘Sentence Directed Video Object Codiscovery,’ *International Journal of Computer Vision (IJCV)*, 124(3):312–334, September 2017, impact factor 8.222, 2 citations.

<http://engineering.purdue.edu/~qobi/papers/ijcv2017.pdf>

## 2018

A.G. Baydin, B.A. Pearlmutter, A.A. Radul, and J.M. Siskind, ‘Automatic Differentiation in Machine Learning: a Survey,’ *Journal of Machine Learning Research (JMLR)*, 18(153):1–43, April 2018, impact factor 5.000, 106 citations.

<http://engineering.purdue.edu/~qobi/papers/jmlr2018.pdf>

D.P. Barrett, S.A. Bronikowski, H. Yu, and J.M. Siskind, ‘Driving Under the Influence (of Language),’ *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 29(7):2668–2683, July 2018, impact factor 6.108, 4 citations.

<http://engineering.purdue.edu/~qobi/papers/tnnls2018.pdf>

J.M. Siskind and B.A. Pearlmutter, ‘Divide-and-Conquer Checkpointing for Arbitrary Programs with No User Annotation,’ *Optimization Methods and Software (OMS)*, 33(4–6):1288–1330, September 2018, impact factor 1.023.

<http://engineering.purdue.edu/~qobi/papers/oms2018.pdf>

## in press

O. Manzyuk, B.A. Pearlmutter, A.A. Radul, D.R. Rush, and J.M. Siskind, ‘Confusion of Tagged Perturbations in Forward Automatic Differentiation of Higher-Order Functions,’ *Higher-Order and Symbolic Computation (HOSC)*, accepted.

<http://engineering.purdue.edu/~qobi/papers/hosc-accepted.pdf>

## Refereed Conference Publications

## 1982

J.M. Siskind, J.R. Southard, and K.W. Crouch, ‘Generating Custom High Performance VLSI Designs from Succinct Algorithmic Descriptions,’ *Proceedings of the Conference on Advanced Research in VLSI*, pp. 28–40, January 1982, oral 21/82 (25%), 94 citations.

<http://engineering.purdue.edu/~qobi/papers/arv1982.pdf>

## 1990

J.M. Siskind, ‘Acquiring Core Meanings of Words, Represented as Jackendoff-Style Conceptual Structures, From Correlated Streams of Linguistic and Non-Linguistic Input,’ *Proceedings of the Twenty Eighth Annual Meeting of the Association for Computational Linguistics (ACL)*, pp. 143–156, June 1990, oral, 41 citations.

<http://engineering.purdue.edu/~qobi/papers/acl90.pdf>

**1993**

J.M. Siskind and D.A. McAllester, 'Nondeterministic Lisp as a Substrate for Constraint Logic Programming,' *Proceedings of the Eleventh National Conference on Artificial Intelligence (AAAI)*, pp. 133–138, July 1993, oral 135/>500 (<27%), 91 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai93.pdf>

**1994**

J.M. Siskind, 'Lexical Acquisition in the Presence of Noise and Homonymy,' *Proceedings of the Twelfth National Conference on Artificial Intelligence (AAAI)*, pp. 760–766, July 1994, oral 222/780 (28%), 31 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai94.pdf>

**1996**

J.M. Siskind and Q. Morris, 'A Maximum-Likelihood Approach to Visual Event Classification,' *Proceedings of the Fourth European Conference on Computer Vision (ECCV)*, pp. 347–360, April 1996, oral 43/328 (13%), 91 citations.

<http://engineering.purdue.edu/~qobi/papers/eccv96a.pdf>

R. Mann, A.D. Jepson, and J.M. Siskind, 'Computational Perception of Scene Dynamics,' *Proceedings of the Fourth European Conference on Computer Vision (ECCV)*, pp. 528–539, April 1996, poster 123/328 (37%), 44 citations.

<http://engineering.purdue.edu/~qobi/papers/eccv96b.pdf>

**2000**

J.M. Siskind, 'Visual Event Classification via Force Dynamics,' *Proceedings of the Seventeenth National Conference on Artificial Intelligence (AAAI)*, pp. 149–155, August 2000, oral 143/432 (33%). Also available as Technical Report 2000-007, NEC Research Institute, Inc., January 2000. Revised as Technical Report 2000-047R, NEC Research Institute, Inc., April 2000, 56 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai2000.pdf>

**2001**

S. Wang and J.M. Siskind, 'Image Segmentation with Minimum Mean Cut,' *Proceedings of the Eighth International Conference on Computer Vision (ICCV)*, pp. 517–524, July 2001, poster 205/596 (34%). Also available as Technical Report 2000-169, NEC Research Institute, Inc., December 2000, 91 citations.

<http://engineering.purdue.edu/~qobi/papers/iccv2001.pdf>

**2002**

A.P. Fern, R.L. Givan, and J.M. Siskind, 'Specific-to-General Learning for Temporal Events,' *Proceedings of the Eighteenth National Conference on Artificial Intelligence (AAAI)*, pp. 152–158, July 2002, poster 120/470 (25%), 7 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai2002a.pdf>

A.P. Fern, J.M. Siskind, and R.L. Givan, 'Learning Temporal, Relational, Force-Dynamic Event Definitions from Video,' *Proceedings of the Eighteenth National Conference on Artificial Intelligence (AAAI)*, pp. 159–166, July 2002, oral 47/470 (10%), 19 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai2002b.pdf>

**2003**

I. Pollak, J.M. Siskind, M.P. Harper, and C.A. Bouman, 'Modeling and Estimation of Spatial Random Trees with Application to Image Classification,' *Proceedings of the 2003 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, volume III, pp. 305–308, Hong Kong, 6–12 April 2003, 1290/2377 (54%), 11 citations.

<http://engineering.purdue.edu/~qobi/papers/icassp2003.pdf>

I. Pollak, J.M. Siskind, M.P. Harper, and C.A. Bouman, 'Parameter Estimation for Spatial Random Trees Using the EM Algorithm,' *Proceedings of the International Conference on Image Processing (ICIP)*, pp. 257–260, Barcelona, Spain, September 2003, poster 827/1901 (43%), 13 citations.

<http://engineering.purdue.edu/~qobi/papers/icip2003.pdf>

S. Wang, T. Kubota, and J.M. Siskind, ‘Salient Boundary Detection Using Ratio Contour,’ *Proceedings of the Neural Information Processing Systems Conference (NIPS)*, pp. 1571–1578, Vancouver, Canada, 9–11 December 2003, poster 198/717 (27%), 27 citations.

<http://engineering.purdue.edu/~qobi/papers/nips2003.pdf>

#### 2007

B.A. Pearlmutter and J.M. Siskind, ‘Lazy Multivariate Higher-Order Forward-Mode AD,’ *Proceedings of the 34th Annual Symposium on Principles of Programming Languages (POPL)*, pp. 155–160, Nice, France, 17–19 January 2007, oral 36/200 (18%), 26 citations.

<http://engineering.purdue.edu/~qobi/papers/popl2007a.pdf>

J.M. Siskind and B.A. Pearlmutter, ‘First-Class Nonstandard Interpretations by Opening Closures,’ *Proceedings of the 34th Annual Symposium on Principles of Programming Languages (POPL)*, pp. 71–76, Nice, France, 17–19 January 2007, oral 36/200 (18%), 14 citations.

<http://engineering.purdue.edu/~qobi/papers/popl2007b.pdf>

#### 2008

B.A. Pearlmutter and J.M. Siskind, ‘Using Programming Language Theory to Make AD Sound and Efficient,’ *Proceedings of the 5th International Conference on Automatic Differentiation (AD2008)*, pp. 79–90, Bonn, Germany, 11–15 August 2008, oral, 9 citations.

<http://engineering.purdue.edu/~qobi/papers/ad2008.pdf>

#### 2010

A. Barbu, N. Siddharth, and J.M. Siskind, ‘Learning Physically-Instantiated Game Play Through Visual Observation,’ *Proceedings of the 2010 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1879–1886, Anchorage, AK, 3–8 May 2010, oral 856/2062 (42%), 21 citations.

<http://engineering.purdue.edu/~qobi/papers/icra2010.pdf>

#### 2011

N. Siddharth, A. Barbu, and J.M. Siskind, ‘A Visual Language Model for Estimating Object Pose and Structure in a Generative Visual Domain,’ *Proceedings of the 2011 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 4854–4860, Shanghai, China, 9–13 May 2011, oral 982/2004 (49%), 4 citations.

<http://engineering.purdue.edu/~qobi/papers/icra2011.pdf>

D. Wingate, N. Goodman, A. Stuhlmüller, and J.M. Siskind, ‘Nonstandard Interpretations of Probabilistic Programs for Efficient Inference,’ *Proceedings of the Neural Information Processing Systems Conference (NIPS)*, Granada, Spain, 12–15 December 2011, poster 306/1400 (22%), 28 citations.

<http://engineering.purdue.edu/~qobi/papers/nips2011.pdf>

#### 2012

Z. Zhang, S. Fidler, J.W. Waggoner, Y. Cao, S. Dickinson, J.M. Siskind, and S. Wang, ‘Superedge grouping for object localization by combining appearance and shape information,’ *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 3266–3273, Providence, RI, 16–21 June 2012, poster 465/1933 (24%), 8 citations.

<http://engineering.purdue.edu/~qobi/papers/cvpr2012.pdf>

A. Radul, B.A. Pearlmutter, and J.M. Siskind, ‘AD in Fortran: Implementation via Preprocessor,’ *Proceedings of the 6th International Conference on Automatic Differentiation (AD2012)*, pp. 273–284, Fort Collins, CO, 23–27 July 2012, oral, 5 citations.

<http://engineering.purdue.edu/~qobi/papers/ad2012.pdf>

A. Barbu, A. Bridge, Z. Burchill, D. Coroian, S. Dickinson, S. Fidler, A. Michaux, S. Mussman, N. Siddharth, D. Salvi, L. Schmidt, J. Shanguan, J.M. Siskind, J. Waggoner, S. Wang, J. Wei, Y. Yin, and Z. Zhang, ‘Video in sentences out,’ *Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence (UAI)*, pp. 102–112, Catalina, CA, 15–17 August 2012, oral 24/304 (8%), 108 citations.

<http://engineering.purdue.edu/~qobi/papers/uai2012.pdf>

N. Siddharth, A. Barbu, and J.M. Siskind, ‘Seeing Unseeability to See the Unseeable,’ *First Annual Conference for Advances in Cognitive Systems (ACS)*, pp. 77–94, Palo Alto, CA, 6–8 December 2012, oral 14/38 (37%).

<http://engineering.purdue.edu/~qobi/papers/acs2012a.pdf>

A. Barbu, N. Siddharth, A. Michaux, and J.M. Siskind, ‘Simultaneous Object Detection, Tracking, and Event Recognition,’ *First Annual Conference for Advances in Cognitive Systems (ACS)*, pp. 203–220, Palo Alto, CA, 6–8 December 2012, oral 14/38 (37%).

<http://engineering.purdue.edu/~qobi/papers/acs2012b.pdf>

### 2013

Y. Cao, D. Barrett, A. Barbu, N. Siddharth, H. Yu, A. Michaux, Y. Lin, S. Dickinson, J.M. Siskind, and S. Wang, ‘Recognize Human Activities from Partially Observed Videos,’ *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 2658–2665, Portland, OR, 25–27 June 2013, poster 472/1870 (25.2%), 102 citations.

<http://engineering.purdue.edu/~qobi/papers/cvpr2013.pdf>

H. Yu and J.M. Siskind, ‘Grounded Language Learning from Video Described with Sentences,’ *Proceedings of the 51st Annual Meeting of the Association for Computational Linguistics (ACL)*, pp. 56–63, Sofia, Bulgaria, 4–9 August 2013, oral 175/662 (26.4%), **best paper award**, 115 citations.

<http://engineering.purdue.edu/~qobi/papers/acl2013.pdf>

### 2014

N. Siddharth, A. Barbu, and J.M. Siskind, ‘Seeing What You’re Told: Sentence-Guided Activity Recognition In Video,’ *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 732–739, Columbus, OH, 24–27 June 2014, poster, 25 citations.

<http://engineering.purdue.edu/~qobi/papers/cvpr2014.pdf>

A. Barbu, D.P. Barrett, W. Chen, N. Siddharth, C. Xiong, J.J. Corso, C.D. Fellbaum, C. Hanson, S.J. Hanson, S. Hélie, E. Malaia, B.A. Pearlmutter, J.M. Siskind, T.M. Talavage, and R.B. Wilbur, ‘Seeing is Worse than Believing: Reading People’s Minds Better than Computer-Vision Methods Recognize Actions,’ *Proceedings of the Thirteenth European Conference on Computer Vision (ECCV)*, volume V, pp. 612–627, Zürich, Switzerland, 8–11 September 2014, poster, 39 citations.

<http://engineering.purdue.edu/~qobi/papers/eccv2014.pdf>

### 2015

J.M. Siskind, ‘Conducting Neuroscience to Guide the Development of AI,’ *Proceedings of the Twenty-Ninth Conference on Artificial Intelligence (AAAI)*, pp. 4067–4072, Austin, TX, 25–30 January 2015, oral, **blue sky ideas/senior member track**, 1 citation.

<http://engineering.purdue.edu/~qobi/papers/aaai2015a.pdf>

H. Yu and J.M. Siskind, ‘Learning to Describe Video with Weak Supervision by Exploiting Negative Sentential Information,’ *Proceedings of the Twenty-Ninth Conference on Artificial Intelligence (AAAI)*, pp. 3855–3863, Austin, TX, 25–30 January 2015, oral, 3 citations.

<http://engineering.purdue.edu/~qobi/papers/aaai2015b.pdf>

### 2016

J.M. Siskind and B.A. Pearlmutter, ‘Binomial Checkpointing for Arbitrary Programs with No User Annotation,’ *Extended abstract, presented at the International Conference on Algorithmic Differentiation (AD)*, Oxford, UK, 12–15 September 2016, oral, 1 citation.

<http://engineering.purdue.edu/~qobi/papers/ad2016a.pdf>

J.M. Siskind and B.A. Pearlmutter, ‘Efficient Implementation of a Higher-Order Language with Built-In AD,’ *Extended abstract, presented at the International Conference on Algorithmic Differentiation (AD)*, Oxford, UK, 12–15 September 2016, oral, 7 citations.

<http://engineering.purdue.edu/~qobi/papers/ad2016b.pdf>

A.G. Baydin, B.A. Pearlmutter, and J.M. Siskind, ‘DiffSharp: An AD Library for .NET Languages,’ *Extended abstract, presented at the International Conference on Algorithmic Differentiation (AD)*, Oxford, UK, 12–15 September 2016, oral, 3 citations.

<http://engineering.purdue.edu/~qobi/papers/ad2016c.pdf>

A.G. Baydin, B.A. Pearlmutter, and J.M. Siskind, ‘Tricks from Deep Learning,’ *Extended abstract, presented at the International Conference on Algorithmic Differentiation (AD)*, Oxford, UK, 12–15 September 2016, oral, 4 citations.

<http://engineering.purdue.edu/~qobi/papers/ad2016d.pdf>

R. Kelly, B.A. Pearlmutter, and J.M. Siskind, ‘Evolving the Incremental  $\lambda$  Calculus into a Model of Forward AD,’ *Extended abstract, presented at the International Conference on Algorithmic Differentiation (AD)*, Oxford, UK, 12–15 September 2016, poster.

<http://engineering.purdue.edu/~qobi/papers/ad2016e.pdf>

## 2017

C.R. Bradley, J.M. Siskind, and R.B. Wilbur, ‘Neural representation of minimal syntactic units,’ *Annual Conference on Cognitive Computational Neuroscience (CCN)*, New York, NY, 6–8 September 2017, poster.

<http://engineering.purdue.edu/~qobi/papers/ccn2017.pdf>

## Patents Awarded

### 2004

J.M. Siskind, ‘Method of Determining the Stability of Two Dimensional Polygonal Scenes,’ US patent 6,693,630, 17 February 2004, 5 citations.

<http://google.com/patents/US6693630.pdf>

### 2005

J.M. Siskind, ‘Method for Computing all Occurrences of a Compound Event from Occurrences of Primitive Events,’ US patent 6,941,290, 6 September 2005, 9 citations.

<http://google.com/patents/US6941290.pdf>

### 2012

J.M. Siskind and B.A. Pearlmutter, ‘Map-Closure: A General Purpose Mechanism for Nonstandard Interpretation,’ US patent 8,281,299, 2 October 2012, 42 citations.

<http://google.com/patents/US8281299.pdf>

### 2014

J.M. Siskind and B.A. Pearlmutter, ‘Automatic Derivative Method for a Computer Programming Language,’ US patent 8,739,137, 27 May 2014, 34 citations.

<http://google.com/patents/US8739137.pdf>

### 2015

J.M. Siskind, A. Barbu, N. Siddharth, and H. Yu, ‘Correlating Videos and Sentences,’ US patent 9,183,466, 10 November 2015, 5 citations.

<https://patents.google.com/patent/US9183466B2/en>

## Patent Applications Filed

### 2016

J.M. Siskind and H. Yu, ‘System and Method for Sentence Directed Video Object Codetection,’ US provisional patent 62/346459, filed 6 June 2016, application PCT/US17/48750, filed 6 June 2017.

<https://patentimages.storage.googleapis.com/16/1e/5f/5336dd39e310d8/WO2017214208A1.pdf>

J.M. Siskind, H. Yu, S.A. Bronikowski, and D.P. Barrett, ‘System and Method for Controlling a Self-Guided Vehicle,’ US provisional patent 62/379245, filed 25 August 2016, application PCT/US17/36232, filed 25 August 2017.

J.M. Siskind and B.A. Pearlmutter, ‘System and Method for Binomial Checkpointing,’ US provisional patent 62/393894, filed 13 September 2016, application PCT/US17/51426, filed 13 September 2017.

### Book Chapters

#### **1997**

J.M. Siskind, ‘Visual Event Perception,’ in *Symbolic Visual Learning*, K. Ikeuchi and M. Veloso ed., Oxford University Press, chapter 9, pp. 225–263, January 1997, 9 citations.

<http://engineering.purdue.edu/~qobi/papers/svl95.pdf>

#### **2000**

J.M. Siskind, ‘Learning Word-to-Meaning Mappings,’ in *Models of Language Acquisition: Inductive and Deductive Approaches*, P. Broeder and J. Murre ed., Oxford University Press, chapter 7, pp. 121–153, July 2000, 37 citations.

<http://engineering.purdue.edu/~qobi/papers/cmla96.pdf>

### Workshop Publications

#### **1991**

J.M. Siskind, ‘Dispelling Myths about Language Bootstrapping,’ *Proceedings of the AAAI Spring Symposium on Machine Learning of Natural Language and Ontology*, pp. 157–164, March 1991, oral, 12 citations.

<http://engineering.purdue.edu/~qobi/papers/dispell.pdf>

J.M. Siskind, ‘Naive Physics, Event Perception, Lexical Semantics and Language Acquisition,’ *Proceedings of the AAAI Spring Symposium on Machine Learning of Natural Language and Ontology*, pp. 165–168, March 1991, oral.

<http://engineering.purdue.edu/~qobi/papers/aaai91ss.pdf>

#### **1993**

J.M. Siskind, ‘Solving a Lexical Acquisition Task via an Encoding as a Propositional Satisfiability Problem,’ *Proceedings of the CUNY Sentence Processing Conference*, p. 82, March 1993, poster.

<http://engineering.purdue.edu/~qobi/papers/cuny93.pdf>

J.M. Siskind, ‘Grounding Language in Perception,’ *Proceedings of the Annual Conference of the Society of Photo-Optical Instrumentation Engineers (SPIE)*, volume 2055, Intelligent Robots and Computer Vision XII, pp. 198–211, September 1993, oral, 6 citations.

<http://engineering.purdue.edu/~qobi/papers/spie93.pdf>

#### **1994**

J.M. Siskind, ‘Axiomatic Support for Event Perception,’ *Proceedings of the AAAI Workshop on Integration of Natural Language and Vision Processing*, pp. 153–160, August 1994, oral.

<http://engineering.purdue.edu/~qobi/papers/aaai94ws.pdf>

#### **1995**

J.M. Siskind, ‘Robust Lexical Acquisition Despite Extremely Noisy Input,’ *Proceedings of the 19th Boston University Conference on Language Development*, MacLaughlin, D. and McEwen, S. ed., Cascadilla Press, pp. 587–598, March 1995, oral, 1 citation.

<http://engineering.purdue.edu/~qobi/papers/bucl95.pdf>

#### **1996**

J.M. Siskind, ‘Unsupervised Learning of Visually-Observed Events,’ *Proceedings of the AAAI Fall Symposium on Learning Complex Behaviors in Adaptive Intelligent Systems*, pp. 82–83, November 1996, oral.

<http://engineering.purdue.edu/~qobi/papers/aaai96fs.pdf>

#### **1998**

J.M. Siskind, ‘Visual Event Perception,’ *Proceedings of the Ninth NEC Research Symposium*, August 1998, oral. Also available as Technical Report 99-033, NEC Research Institute, Inc., March 1999, 17 citations.

<http://engineering.purdue.edu/~qobi/papers/nara98.pdf>

**2003**

I. Pollak, J.M. Siskind, M.P. Harper, and C.A. Bouman, ‘Multiscale Random Tree Models,’ *IS&T/SPIE 15th Annual Symposium on Electronic Imaging*, Santa Clara, CA, 21–24 January 2003.

J.M. Siskind, I. Pollak, M.P. Harper, and C.A. Bouman, ‘Stochastic Grammars for Images on Arbitrary Graphs,’ *Proceedings of the IEEE Workshop on Statistical Signal Processing*, St. Louis, MO, 28 September–1 October 2003, 1 citation.

**2004**

I. Pollak, J.M. Siskind, M.P. Harper, and C.A. Bouman, ‘Modeling of Images with Spatial Random Trees,’ *SIAM Conference on Imaging Science*, Salt Lake City, UT, 3–5 May 2004.

**2005**

J.M. Siskind and B.A. Pearlmutter, ‘Perturbation Confusion and Referential Transparency: Correct Functional Implementation of Forward-Mode AD,’ *Draft Proceedings of the 17th International Workshop on Implementation and Application of Functional Languages (IFL2005)*, Dublin, Ireland, 19–21 September 2005, oral, 13 citations.

<http://engineering.purdue.edu/~qobi/papers/ifl2005.pdf>

**2014**

A. Barbu, N. Siddharth, and J.M. Siskind, ‘Language-Driven Video Retrieval,’ *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshop on Vision Meets Cognition (CVPR Workshop)*, Columbus, OH, 23 June 2014, poster, 4 citations.

<http://engineering.purdue.edu/~qobi/papers/fpic2014.pdf>

### Technical Reports

**1989**

J.M. Siskind, ‘The Culprit Pointer Method for Selective Backtracking,’ S. M. thesis, Artificial Intelligence Laboratory, MIT, January 1989.

**1991**

D.A. McAllester and J.M. Siskind, ‘Lifting Transformations,’ AI Memo 1343, Artificial Intelligence Laboratory, MIT, December 1991, 4 citations.

<http://engineering.purdue.edu/~qobi/papers/AIM-1343.pdf>

**1992**

J.M. Siskind, ‘Naive Physics, Event Perception, Lexical Semantics and Language Acquisition,’ Ph.D. thesis, Artificial Intelligence Laboratory, MIT, January 1992, 93 citations.

<http://engineering.purdue.edu/~qobi/papers/phd.pdf>

**1993**

J.M. Siskind and D.A. McAllester, ‘Screamer: A Portable Efficient Implementation of Nondeterministic Common Lisp,’ Technical Report IRCS-93-03, Institute for Research in Cognitive Science, University of Pennsylvania, 1993, 43 citations.

<http://engineering.purdue.edu/~qobi/papers/ircs-93-03.pdf>

J.M. Siskind, ‘Lexical Acquisition as Constraint Satisfaction,’ Technical Report IRCS-93-41, Institute for Research in Cognitive Science, University of Pennsylvania, 1993, 10 citations.

<http://engineering.purdue.edu/~qobi/papers/ircs-93-41.pdf>

**1999**

J.M. Siskind, ‘Flow-Directed Lightweight Closure Conversion,’ Technical Report 99-105, NEC Research Institute, Inc., July 1999. Revised as Technical Report 99-190R, NEC Research Institute, Inc., December 1999, 31 citations.

<http://engineering.purdue.edu/~qobi/papers/fdlcc.pdf>

**2002**

S. Wang and J.M. Siskind, ‘Image Segmentation with Ratio Cut—Extended Version,’ Technical Report TR-ECE-02-07, School of Electrical and Computer Engineering, Purdue University, 2002, 3 citations.  
<http://engineering.purdue.edu/~qobi/papers/TR-ECE-02-07.pdf>

**2003**

I. Pollak, J.M. Siskind, M.P. Harper, and C.A. Bouman, ‘Spatial Random Trees and the Center-Surround Algorithm,’ Technical Report TR-ECE-03-03, School of Electrical and Computer Engineering, Purdue University, 2003, 12 citations.  
<http://engineering.purdue.edu/~qobi/papers/TR-ECE-03-03.pdf>

**2008**

J.M. Siskind and B.A. Pearlmutter, ‘Using Polyvariant Union-Free Flow Analysis to Compile a Higher-Order Functional-Programming Language with a First-Class Derivative Operator to Efficient Fortran-like Code,’ Technical Report TR-ECE-08-01, School of Electrical and Computer Engineering, Purdue University, January 2008, 11 citations.  
<http://docs.lib.purdue.edu/ecetr/367>

J.M. Siskind and B.A. Pearlmutter, ‘Putting the Automatic Back into AD: Part I, What’s Wrong,’ Technical Report TR-ECE-08-02, School of Electrical and Computer Engineering, Purdue University, January 2008.  
<http://docs.lib.purdue.edu/ecetr/368>

B.A. Pearlmutter and J.M. Siskind, ‘Putting the Automatic Back into AD: Part II, Dynamic, Automatic, Nestable, and Fast,’ Technical Report TR-ECE-08-03, School of Electrical and Computer Engineering, Purdue University, January 2008, 5 citations.  
<http://docs.lib.purdue.edu/ecetr/369>

J.M. Siskind and B.A. Pearlmutter, ‘Nesting Forward-Mode AD in a Functional Framework,’ Technical Report TR-ECE-08-09, School of Electrical and Computer Engineering, Purdue University, October 2008.  
<http://docs.lib.purdue.edu/ecetr/377>

**2011**

J.M. Siskind, ‘Grounding the Lexical Semantics of Verbs in Visual Perception Using Force Dynamics and Event Logic,’ arXiv:1106.0256, 1 June 2011.  
<http://arxiv.org/abs/1106.0256>

A.P. Fern, R.L. Givan, and J.M. Siskind, ‘Specific-to-General Learning for Temporal Events with Application to Learning Event Definitions from Video,’ arXiv:1106.4572, 22 June 2011.  
<http://arxiv.org/abs/1106.4572>

**2012**

A. Radul, B.A. Pearlmutter, and J.M. Siskind, ‘AD in Fortran, Part 1: Design,’ arXiv:1203.1448, 7 March 2012, 4 citations.  
<http://arxiv.org/abs/1203.1448>

A. Radul, B.A. Pearlmutter, and J.M. Siskind, ‘AD in Fortran, Part 2: Implementation via Preprocessor,’ arXiv:1203.1450, 7 March 2012.  
<http://arxiv.org/abs/1203.1450>

A. Barbu, A. Michaux, N. Siddharth, and J.M. Siskind, ‘Simultaneous Object Detection, Tracking, and Event Recognition,’ arXiv:1204.2741, 12 April 2012.  
<http://arxiv.org/abs/1204.2741>

A. Barbu, A. Bridge, Z. Burchill, D. Coroian, S. Dickinson, S. Fidler, A. Michaux, S. Mussman, N. Siddharth, D. Salvi, L. Schmidt, J. Shangquan, J.M. Siskind, J. Waggoner, S. Wang, J. Wei, Y. Yin, and Z. Zhang, ‘Video In Sentences Out,’ arXiv:1204.2742, 12 April 2012.  
<http://arxiv.org/abs/1204.2742>

N. Siddharth, A. Barbu, and J.M. Siskind, 'Seeing Unseeability to See the Unseeable,' arXiv:1204.2801, 12 April 2012.

<http://arxiv.org/abs/1204.2801>

A. Barbu, A. Bridge, D. Coroian, S. Dickinson, S. Mussman, N. Siddharth, D. Salvi, L. Schmidt, J. Shangguan, J.M. Siskind, J. Waggoner, S. Wang, J. Wei, Y. Yin, and Z. Zhang, 'Large-Scale Automatic Labeling of Video Events with Verbs Based on Event-Participant Interaction,' arXiv:1204.3616, 16 April 2012, 4 citations.

<http://arxiv.org/abs/1204.3616>

O. Manzyuk, B.A. Pearlmutter, A.A. Radul, D.R. Rush, and J.M. Siskind, 'Confusion of Tagged Perturbations in Forward Automatic Differentiation of Higher-Order Functions,' arXiv:1211.4892, 20 November 2012, 4 citations.

<http://arxiv.org/abs/1211.4892>

## 2013

A. Barbu, N. Siddharth, C. Xiong, J.J. Corso, C.D. Fellbaum, C. Hanson, S.J. Hanson, S. Hélie, E. Malaia, B.A. Pearlmutter, J.M. Siskind, T.M. Talavage, and R.B. Wilbur, 'The Compositional Nature of Verb and Argument Representations in the Human Brain,' arXiv:1306.2293, 10 June 2013, 1 citation.

<http://arxiv.org/abs/1306.2293>

D.P. Barrett and J.M. Siskind, 'Felzenszwalb-Baum-Welch: Event Detection by Changing Appearance,' arXiv:1306.4746, 20 June 2013, 1 citation.

<http://arxiv.org/abs/1306.4746>

H. Yu and J.M. Siskind, 'Discriminative Training: Learning to Describe Video with Sentences, from Video Described with Sentences,' arXiv:1306.5263, 21 June 2013.

<http://arxiv.org/abs/1306.5263>

N. Siddharth, A. Barbu, and J.M. Siskind, 'Seeing What You're Told: Sentence-Guided Activity Recognition in Video,' arXiv:1308.4189, 19 August 2013.

<http://arxiv.org/abs/1308.4189>

A. Barbu, N. Siddharth, and J.M. Siskind, 'Saying What You're Looking For: Linguistics Meets Video Search,' arXiv:1309.5174, 20 September 2013, 3 citations.

<http://arxiv.org/abs/1309.5174>

## 2014

A. Barbu, A. Bridge, Z. Burchill, D. Coroian, S. Dickinson, S. Fidler, A. Michaux, S. Mussman, N. Siddharth, D. Salvi, L. Schmidt, J. Shangguan, J.M. Siskind, J. Waggoner, S. Wang, J. Wei, Y. Yin, and Z. Zhang, 'Video in sentences out,' arXiv:1408.6418, 9 August 2014.

<http://arxiv.org/abs/1408.6418>

H. Yu, D.P. Barrett, and J.M. Siskind, 'A Faster Method for Tracking and Scoring Videos Corresponding to Sentences,' arXiv:1411.4064, 14 November 2014.

<http://arxiv.org/abs/1411.4064>

## 2015

A. Barbu, N. Siddharth, C. Xiong, J.J. Corso, C.D. Fellbaum, C. Hanson, S.J. Hanson, S. Hélie, E. Malaia, B.A. Pearlmutter, J.M. Siskind, T.M. Talavage, and R.B. Wilbur, 'The Compositional Nature of Event Representations in the Human Brain,' arXiv:1505.06670, 25 May 2015.

<http://arxiv.org/abs/1505.06670>

H. Yu and J.M. Siskind, 'Sentence Directed Video Object Codetection,' arXiv:1506.02059, 5 June 2015, 3 citations.

<http://arxiv.org/abs/1506.02059>

D.P. Barrett, S.A. Bronikowski, H. Yu, and J.M. Siskind, 'Robot Language Learning, Generation, and Comprehension,' arXiv:1508.06161, 25 August 2015, 8 citations.

<http://arxiv.org/abs/1508.06161>

D.P. Barrett, R. Xu, H. Yu, and J.M. Siskind, ‘Collecting and Annotating the Large Continuous Action Dataset,’ arXiv:1511.05914, 18 November 2015.

<http://arxiv.org/abs/1511.05914>

A.G. Baydin, B.A. Pearlmutter, A.A. Radul, and J.M. Siskind, ‘Automatic differentiation in machine learning: a survey,’ arXiv:1502.05767, 19 April 2015.

<http://arxiv.org/abs/1502.05767>

A.G. Baydin, B.A. Pearlmutter, and J.M. Siskind, ‘DiffSharp: Automatic Differentiation Library,’ arXiv:1511.07727, 26 November 2015, 4 citations.

<http://arxiv.org/abs/1511.07727>

## 2016

J.M. Siskind and B.A. Pearlmutter, ‘Binomial Checkpointing for Arbitrary Programs with No User Annotation,’ arXiv:1611.03410, 10 November 2016, 1 citation.

<http://arxiv.org/abs/1611.03410>

J.M. Siskind and B.A. Pearlmutter, ‘Efficient Implementation of a Higher-Order Language with Built-In AD,’ arXiv:1611.03416, 10 November 2016.

<http://arxiv.org/abs/1611.03416>

A.G. Baydin, B.A. Pearlmutter, and J.M. Siskind, ‘DiffSharp: An AD Library for .NET Languages,’ arXiv:1611.03423, 10 November 2016.

<http://arxiv.org/abs/1611.03423>

R. Kelly, B.A. Pearlmutter, and J.M. Siskind, ‘Evolving the Incremental  $\lambda$  Calculus into a Model of Forward AD,’ arXiv:1611.03429, 10 November 2016.

<http://arxiv.org/abs/1611.03429>

A.G. Baydin, B.A. Pearlmutter, and J.M. Siskind, ‘Tricks from Deep Learning,’ arXiv:1611.03777, 10 November 2016.

<http://arxiv.org/abs/1611.03777>

## 2017

J.M. Siskind and B.A. Pearlmutter, ‘Divide-and-Conquer Checkpointing for Arbitrary Programs with No User Annotation,’ arXiv:1708.06799, 22 August 2017, 1 citation.

<http://arxiv.org/abs/1708.06799>

## 2018

V. Dhiman, S. Banerjee, B. Griffin, J.M. Siskind, and J.J. Corso, ‘A Critical Investigation of Deep Reinforcement Learning for Navigation,’ arXiv:1802.02274, 7 February 2018.

<http://arxiv.org/abs/1802.02274>

V. Dhiman, S. Banerjee, J.M. Siskind, and J.J. Corso, ‘Floyd-Warshall Reinforcement Learning: Learning from Past Experiences to Reach New Goals,’ arXiv:1809.09318, 25 September 2018.

<http://arxiv.org/abs/1809.09318>

## Invited Presentations

### 1982

*IEEE Asilomar Microcomputer Workshop*, April 1982.

*Edinburgh Conference on Silicon Compilation*, July 1982.

### 1984

*IEEE Catalina Workshop on Logic Synthesis and Silicon Compilation*, April 1984.

Panel discussion on Silicon Compilation, *ACM IEEE Design Automation Conference (DAC)*, June 1984.

### 1985

Panel discussion on Silicon Compilation, *Custom Integrated Circuits Conference (CICC)*, May 1985.

**1991**

‘Dispelling Myths about Language Bootstrapping,’ *Boston University Conference on Language Development*, October 1991.

**1994**

‘Computational Models of Lexical Acquisition and Event Perception in Support of Lexical Acquisition,’ *Workshop on Cognitive Models of Language Acquisition*, April 1994.

**1999**

‘Visual Event Perception,’ Invited presentation at *ICCV Workshop on Integration of Speech and Image Understanding*, Corfu, Greece, Tuesday 21 September 1999, declined.

**2002**

*Commonsense Symposium*, April 2002.

**2003**

‘Computational Modeling of Child Language Acquisition: A retrospective on Fifteen Years of Research,’ CNRS, June 2003.

**2004**

‘Stochastic Spatio-Temporal Grammars for Images and Video,’ *AAAI Workshop on Anchoring*, July 2004.

‘Stochastic Spatio-Temporal Grammars for Images and Video,’ *AI in the Wild, Belgian-Dutch Conference on Artificial Intelligence (BNAIC)*, October 2004.

**2007**

‘Learning to Represent the Lexical Semantics of Verbs with Force Dynamics from Visual Input,’ Trinity College, Dublin, Tuesday 16 January 2007.

‘Stochastic Spatio-Temporal Grammars for Images and Video,’ *NIPS Workshop on The Grammar of Vision: Probabilistic Grammar-Based Models for Visual Scene Understanding and Object Categorization*, Saturday 8 December 2007.

**2008**

Invited to participate and present at the *Dagstuhl Seminar on Logic and Probability for Scene Interpretation*, Sunday 17–Friday 22 February 2008, declined due to family illness.

‘AD for Probabilistic Programming,’ *NIPS Workshop on Probabilistic Programming: Universal Languages and Inference; systems; and applications*, Saturday 13 December 2008.

**2011**

‘Generating English Utterances to Describe Events in Video,’ *CVPR Workshop on Activity Recognition Competition*, Monday 20 June 2011.

‘Mediating Cross-Modal Perception, Motor Control, Language, and Reasoning with Common and Deep Semantic Representations,’ *AAAI Workshop on Language-Action Tools for Cognitive Artificial Agents: Integrating Vision, Action, and Language*, Sunday 7 August 2011.

‘Grounding Natural Language in Computer Vision and Robotics,’ *NIPS Workshop on Integrating Language and Vision*, Friday 16 December 2011.

**2012**

‘Mediating Cross-Modal Perception, Motor Control, Language, and Reasoning with Common and Deep Semantic Representations,’ University of Buffalo (SUNY), Wednesday 7 March 2012.

**2013**

‘Learning to Say What You See and See What You Say,’ *Joint NAACL/ICML Symposium on Natural Language Processing (NLP) and Machine Learning (ML)*, Saturday 15 June 2013.

‘Seeing and Saying: Compositionally Linking Vision and Language,’ *UW MSR Summer Institute: Understanding Situated Language in Everyday Life*, Wednesday 24 July 2013.

## 2014

‘Seeing, Saying, Doing, and Thinking: The Compositional Structure of Perception, Language, Action, and Thought,’ *AAAI Spring Symposia: Knowledge Representation and Reasoning in Robotics and Qualitative Representations for Robots*, Monday 24 March 2014.

‘Learning to Ground Sentences in Video,’ *NIPS Workshop on Learning Semantics*, Friday 12 December 2014.

## 2015

‘What every machine-learning researcher should know about AD,’ *DALI Workshop on Probabilistic Programming*, Friday 10 April 2015.

‘Computers XOR Vision XOR Language,’ *CVPR Workshop on Vision and Language*, Thursday 11 June 2015.

‘Common Sense Through Language Grounded in Vision and Motor Control,’ *CogSci Workshop on Language & Commonsense: Integrating across psychology, linguistics, and computer science*, Wednesday 22 July 2015.

‘Sentence-directed video object codetection (from egocentric mobile-robot video),’ *ICCV Workshop on Describing and Understanding Video & The Large Scale Movie Description Challenge (LSMDC)*, Saturday 12 December 2015.

## 2016

‘Verbs in the Human Brain,’ *Indiana Neuroimaging Symposium*, Friday 18 November 2016.

‘The tension between convenience and performance in automatic differentiation,’ *NIPS Workshop on The Future of Gradient-Based Machine Learning Software*, Saturday 10 December 2016.

## 2017

‘Binomial Checkpointing for Arbitrary Programs with No User Annotation,’ *SIAM Conference on Computational Science and Engineering (CSE) minisymposium on AD*, Tuesday 28 February 2017.

‘The Linguistic Nature of Human Visual Perception and its Consequences for Building Cognitive Systems,’ *Advances in Cognitive Systems (ACS)*, Saturday 13 May 2017, canceled due to illness.

*CVPR Workshop on Vision Meets Cognition: Functionality, Physics, Intentionality and Causality*, Friday 21 July 2017, canceled due to illness.

‘Driving Under the Influence (of Language),’ *1st Workshop on Autonomy, Robotics and Cognition*, Tuesday 3 October 2017.

‘Joint Language-Vision Inference in Machines and Humans,’ *2017 International Symposium on Perception, Action, and Cognitive Systems*, Friday 3 November 2017.

‘Divide-and-Conquer Checkpointing for Arbitrary Programs with No User Annotation,’ *NIPS Workshop on The Future of Gradient-Based Machine Learning Software & Techniques*, Saturday 9 December 2017.

## 2018

‘Learning Grounded Game Play,’ *CVPR Workshop on Fine-grained Instructional Video undERstanding (FIVER)*, Monday 18 June 2018.

‘Playing with Toys,’ *The 4th CVPR Workshop on Vision Meets Cognition: Functionality, Physics, Intentionality and Causality (FPIC)*, Monday 18 June 2018.

‘Three Approaches to Training Object and Activity Detectors with Less Annotation,’ *CVPR Workshop on Vision with Biased or Scarce Data (VBSD)*, Friday 22 June 2018.

## Teaching Experience

### **University of Pennsylvania**

September–December 1992

*Adjunct Professor, Department of Computer and Information Science*

CIS520, the graduate introductory core course on artificial intelligence, Fall 1992.

### **Philadelphia, Pennsylvania**

**University of Toronto****Toronto, Ontario**

August 1993–December 1995

*Assistant Professor, Department of Computer Science*

CSC324, the undergraduate programming languages course, Fall 1995.

CSC484, the undergraduate introductory course on artificial intelligence, Spring 1994, Spring 1995.

CSC485/CSC2501, the graduate introductory course on natural-language understanding, Fall 1993, Fall 1994, Fall 1995.

CSC2528, the graduate reading seminar on computational linguistics, Spring 1994, Spring 1995.

**Technion, Israel Institute of Technology****Haifa, Israel**

February–August 1996

*Senior Lecturer, Department of Electrical Engineering*

048864, a graduate seminar on visual event perception, Spring 1996.

**University of Vermont****Burlington, Vermont**

September 1996–May 1997

*Visiting Assistant Professor, Department of Computer Science and Electrical Engineering*

CS103, the undergraduate programming languages course, Fall 1996, Spring 1997.

CS251, the undergraduate introductory course on artificial intelligence, Fall 1996.

CS295, the undergraduate introductory course on computational linguistics, Spring 1997.

**Princeton University****Princeton, New Jersey**

September 1998–February 1999

*Visiting Lecturer, Department of Computer Science*

COS302, the undergraduate introductory course on artificial intelligence, Fall 1998.

**Purdue University****West Lafayette, Indiana**

January 2002–present

*Associate Professor in the School of Electrical and Computer Engineering*

ECE47300, the undergraduate introductory course on artificial intelligence, Spring 2002, Spring 2003, Spring 2004, Spring 2005, Spring 2006, Spring 2007, Spring 2008, Spring 2009, Spring 2010, Spring 2011, Spring 2012, Spring 2013, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018.

ECE57000, the graduate introductory course on artificial intelligence, Fall 2002, Fall 2003, Fall 2004, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017.

Current Students

Hamad Ahmed, Ph.D. student, passed QE August 2017.

Thomas Ilyevsky, Ph.D. student, passed QE August 2017.

Jared Johansen, Ph.D. student, passed QE August 2016.

Chengxi Li, Ph.D. student, passed QE August 2016.

Ren Li, Ph.D. student, passed QE August 2016.

Former Students**2005**Vamsi Vytla, M.S., May 2005, *Recovering Unobservable Properties of a Visual Scene Using Perceiver Framework*, Purdue University, employment: Schlumberger, Lawrence Berkeley Laboratory.Pranay Gupta, M.S., December 2005, *Visual Perception and Imitation Grounded in Action*, Purdue University, employment: Google.

**2013**

Andrei Barbu, Ph.D., December 2013, *Reasoning Across Language and Vision in Machines and Humans*, Purdue University, employment: postdoc MIT, research scientist (permanent soft-money position) MIT.

**2014**

Siddharth Narayanaswamy, Ph.D., May 2014, *Compositionality in Vision and Language*, Purdue University, employment: postdoc Stanford, postdoc Oxford.

**2016**

Daniel Paul Barrett, Ph.D., May 2016, *Learning in Vision and Robotics*, Purdue University, employment: Sandia National Laboratories.

Scott Alan Bronikowski, Ph.D., May 2016, *Grounding Robot Motion in Natural Language and Visual Perception*, Purdue University, employment: General Motors.

Haonan Yu, Ph.D., May 2016, *Grounding Language in Video*, Purdue University, employment: Baidu Research.

External Service

**1990**

Session chair, Phonology and Syntax, *Annual Conference of the Cognitive Science Society (CogSci)*, 1990.

**1991**

Member student session program committee, *Annual Meeting of the Association for Computational Linguistics (ACL)*, 1991.

**1995**

Member program committee, *International Workshop on Constraint-Based Reasoning, International Conference of the Florida Artificial Intelligence Research Society (FLAIRS)*, 1995.

Member program committee, *Computational Models for Integrating Language and Vision, AAAI Fall Symposium Series*, 1995.

**1996**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 1996.

Member program committee, *Second International Workshop on Constraint Based Reasoning, International Conference of the Florida Artificial Intelligence Research Society (FLAIRS)*, 1996.

Member program committee, *Workshop on the Representations and Processes between Vision and Natural Language, European Conference on Artificial Intelligence (ECAI)*, 1996.

Member international advisory committee, *Association for Computational Linguistics Special Interest Group on Natural Language Learning (SIGNLL)*, 1996–1997.

**1997**

Member program committee, *Conference on Computational Psycholinguistics (CPL)*, 1997.

**1999**

Member program committee, *Workshop on Computational Natural Language Learning, Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, 1999.

**2001**

Member program committee, *Musical Constraints Workshop, Seventh International Conference on Principles and Practice of Constraint Programming*, 2001.

**2003**

Member program committee, *Scheme Workshop*, 2003.

Co-chair and co-organizer, *Workshop on Learning Word Meaning from Non-Linguistic Data, Human Language Technology and North American Association for Computational Linguistics (HLT-NAACL)*, with Regina Barzilay and Ehud Reiter, 2003.

**2004**

Member program committee, *Workshop on Psycho-computational Models of Human Language Acquisition (PsychoComp)*, *International Conference on Computational Linguistics (COLING)*, 2004.

Member program committee, *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, 2004.

Member program committee, *IEEE Workshop on Perceptual Organization in Computer Vision (POCV)*, *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, 2004.

**2005**

Member program committee, *Annual Conference of the Cognitive Science Society (CogSci)*, 2005.

Member program committee, *International Joint Conference on Artificial Intelligence (IJCAI)*, 2005.

**2006**

Member program committee, *Annual Conference of the Cognitive Science Society (CogSci)*, 2006.

Member program committee, *International Conference on Development and Learning (ICDL)*, 2006.

Co-chair and co-organizer, *IEEE Workshop on Perceptual Organization in Computer Vision (POCV)*, *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, with James Elder, 2006.

**2007**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 2007.

Member program committee, *International Conference on Development and Learning (ICDL)*, 2007.

External hiring-panel member (faculty search and interview committee), *National University of Ireland Maynooth (NUIM)*, 2007.

**2008**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 2008.

Member program committee, *European Lisp Symposium (ELS)*, 2008.

**2010**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 2010.

Member program committee, *International Conference on Development and Learning (ICDL)*, 2010.

Session chair, *International Conference on Robotics and Automation (ICRA)*, 2010.

**2011**

Member program committee, *International Conference on Development and Learning (ICDL)*, 2011.

**2012**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 2012.

Member program committee, *Sixth International Conference on Automatic Differentiation (AD)*, 2012.

External reviewer, *Programming Language Design and Implementation (PLDI)*, 2012.

Member program committee, *First Annual Conference for Advance in Cognitive Systems (ACS)*, 2012.

**2013**

Member program committee, *National Conference on Artificial Intelligence (AAAI)*, 2013.

Member program committee, *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, 2013.

Associate editor and member editorial board, *Artificial Intelligence (AIJ)*, 2013–present.

Session chair, *Annual Meeting of the Association for Computation Linguistics (ACL)*, 2013.

**2014**

Member program committee, *Annual Meeting of the Association for Computation Linguistics (ACL)*, 2014.

## 2016

Program co-chair, senior member track, *Conference on Artificial Intelligence (AAAI)*, with Sarit Kraus, 2016.

## 2019

Co-chair and co-organizer, *The Fourth SIGPLAN Workshop on Languages for Inference (LAFI)*, *The 46th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL)*, with Ohad Kammar, 2019.

### Professional Society Membership

Senior member IEEE, member Computer Society, member ACM, member AAAI, member ACL, member SIGNLL, member Cognitive Science Society, member AAUP, member SIAM, member AAAS.

### Coverage in the Popular Press

#### **Silicon Compilation**

##### **1982**

L. Lowe, 'VLSI design shrinks to mere man-weeks,' *Electronics*, pp. 48–50, 10 February 1982.

<http://engineering.purdue.edu/~qobi/popular-press/20140722165742829.pdf>

J. Werner, 'The Silicon Compiler: Panacea, Wishful Thinking, or Old Hat?,' *VLSI Design*, 3:46–52, September/October 1982.

<http://engineering.purdue.edu/~qobi/popular-press/1200394.pdf>

'ICE Status,' *Integrated Circuit Engineering Corporation*, p. 36, 1982.

<http://engineering.purdue.edu/~qobi/popular-press/20140905090317556.pdf>

<http://smithsonianchips.si.edu/>

##### **1983**

M.A. Harris, 'News Update,' *Electronics*, p. 32, 13 January 1983.

<http://engineering.purdue.edu/~qobi/popular-press/1199075.pdf>

J.A. Feldman and E.J. Beauchemin, 'A Custom IC for Automatic Gain Control in LPC Vocoders,' *ICASSP*, pp. 511–514, 1983.

<http://engineering.purdue.edu/~qobi/popular-press/01172095.pdf>

J.R. Fox, 'The MacPitts Silicon Compiler: A View from the Telecommunication Industry,' *VLSI Design*, 4(3):30–37, May/June 1983.

<http://engineering.purdue.edu/~qobi/popular-press/1199076.pdf>

J. Werner, 'Progress Toward the "Ideal" Silicon Compiler Part 1: the Front End,' *VLSI Design*, 4(5):38–41, September 1983.

<http://engineering.purdue.edu/~qobi/popular-press/1199077.pdf>

J. Werner, 'Progress Toward the "Ideal" Silicon Compiler Part 2: the Layout Problem,' *VLSI Design*, 4(6):78–81, October 1983.

<http://engineering.purdue.edu/~qobi/popular-press/1199514.pdf>

D.D. Gajski and R.H. Kuhn, 'Guest Editors' Introduction: New VLSI Tools,' *IEEE Computer*, 16(12):11–14, December 1983.

<http://engineering.purdue.edu/~qobi/popular-press/01654264.pdf>

J.R. Southard, 'MacPitts: An Approach to Silicon Compilation,' *IEEE Computer*, 16(12):74–82, December 1983.

<http://engineering.purdue.edu/~qobi/popular-press/01654270.pdf>

##### **1984**

R. Collett, 'Silicon compilation: a revolution in VLSI design,' *Digital Design*, pp. 88–95, August 1984.

<http://engineering.purdue.edu/~qobi/popular-press/1199079.pdf>

J.R. Southard, 'Silicon compiler demands no hardware expertise to fashion custom chips,' *Electronic Design*, 15 November 1984.

<http://engineering.purdue.edu/~qobi/popular-press/1199081.pdf>

#### 1985

'Automated Chip Design: Reshaping the semiconductor industry,' *High Technology*, cover photo, June 1985.

<http://engineering.purdue.edu/~qobi/popular-press/20140722165408379.pdf>

J.N. Bairstow, 'Chip Design Made Easy,' *High Technology*, pp. 18–25, June 1985.

<http://engineering.purdue.edu/~qobi/popular-press/20140722165614382.pdf>

#### Action Recognition in Video

#### 1998

C. Levin, 'Flysight: Research in computer vision may help computers of the future to see,' *PC Magazine*, p. 28, 15 December 1998.

<http://engineering.purdue.edu/~qobi/popular-press/20140722164138103.pdf>

#### 1999

'Computer See, Computer Do,' Technology Watch, *Popular Mechanics*, p. 18, March 1999.

<http://engineering.purdue.edu/~qobi/popular-press/20140722163959487.pdf>

#### 2013

B. Stevenson, 'Worth a thousand words,' *Digital Battlespace*, 5(4):33–37, July/August 2013.

<http://engineering.purdue.edu/~qobi/popular-press/DB.pdf>

#### Natural Language Command of Mobile Robot Navigation

#### 2017

S. Augenstein, 'Robots Learn Language, Adjust Route Accordingly,' *Laboratory Equipment*, 28 February 2017.

<http://engineering.purdue.edu/~qobi/popular-press/RobotsLearnLanguage,AdjustRouteAccordingly.html>

'US engineers develop language-learning robot,' *The Engineer*, 1 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/USengineersdeveloplanguage-learningrobot,TheEngineer.html>

Daily Planet, *Discovery Channel Canada*, Season 22, Episode 120, 2 March 2017.

[http://engineering.purdue.edu/~qobi/popular-press/Language\\_Learning\\_Robot.mp4](http://engineering.purdue.edu/~qobi/popular-press/Language_Learning_Robot.mp4)

'Создан робот, способный изучить, понять и использовать язык человека,' *freshnews.org*, 5 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/russian.html>

'미 퍼듀대, 사람 말을 이해하는 바퀴 로봇 개발,' *로봇신문사*, 8 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/korean.html>

'Language Learning Robot Could Advance Autonomous Vehicles, Help Emergency Responders in the Future,' *Communications of the ACM (CACM)*, 8 March 2017.

[http://engineering.purdue.edu/~qobi/popular-press/LanguageLearningRobotCouldAdvanceAutonomousVehicles,HelpEmergencyRespondersintheFuture\\_News\\_CommunicationsoftheACM.html](http://engineering.purdue.edu/~qobi/popular-press/LanguageLearningRobotCouldAdvanceAutonomousVehicles,HelpEmergencyRespondersintheFuture_News_CommunicationsoftheACM.html)

'Language-learning wheeled robot,' *Machinery Market News*, 19 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/Language-learningwheeledrobot-MachineryMarketNews.html>

'Purdue pioneering robot tech,' *Indy Star*, p. 5A, 20 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/20170326130952759.pdf>

'Purdue team pioneers in robot technology,' *Lafayette Journal & Courier*, front page, 20 March 2017.

<http://engineering.purdue.edu/~qobi/popular-press/Purdueiteampioneersinrobottechnology.html>

'Using Language to Control a Robot,' *Robot Magazine*, 27 March 2017.  
<http://engineering.purdue.edu/~qobi/popular-press/UsingLanguagettoControlaRobot-RobotMagazi.html>

### Graduate Student Research Supervision

#### **1993**

Richard Mann, graduate research, 1993–1996, University of Toronto. Postdoc, January 1998–July 1999, NEC Research Institute.

#### **1999**

Amit Roy Chowdhury, University of Maryland, graduate summer intern, 1999, NEC Research Institute.

#### **2000**

Song Wang, UIUC, graduate summer intern, 2000, 2001, NEC Research Institute.

#### **2002**

Min Lu, graduate research, Spring–Fall 2002, Purdue University.

#### **2003**

Shawn Alan Brownfield, graduate research, Fall 2003–Spring 2007, Purdue University.

#### **2007**

Rezwanuzzaman Chowdhury, graduate research, Fall 2007–Spring 2008, Purdue University.

#### **2008**

Alejandrina Cristià, LING59000, Spring 2008, Purdue University.

Padmini Jaikumar, graduate research, Fall 2008, Purdue University.

#### **2010**

Jeff Johnson, Indiana University, graduate research, December 2010, Purdue University.

Dhaval Salvi, University of South Carolina, graduate research, December 2010–January 2011, Purdue University.

Jarrell Waggoner, University of South Carolina, graduate research, December 2010–January 2011, Purdue University.

#### **2011**

Aaron Michaux, graduate research, May 2011–March 2013, Purdue University.

Ryan Buffington, graduate research, August 2011–May 2012, Purdue University.

Tommy Y. Chang, graduate research, August 2011–January 2013, Purdue University.

#### **2012**

David Schwartzman Cohenca, graduate research, January–June 2012, Purdue University.

#### **2013**

Tsz Kwan Lam, LING69000, Spring 2013, Purdue University.

Anantha P. Raghuraman, graduate research, Fall 2013, Purdue University.

Xiran Wang, graduate research, August 2013–June 2014, Purdue University.

#### **2014**

Sarvesh Vijay Pradhan, graduate research, Fall 2014–Spring 2015, Purdue University.

#### **2015**

Abdullah Bader Alshaibani, graduate research, Spring 2015–Spring 2016, Purdue University.

#### **2016**

Charles Roger Bradley, LING69900, Summer 2016, Purdue University.

#### **2017**

Vikas Dhiman, University of Michigan, graduate summer intern, 2017, Purdue University.

## Undergraduate Student Research Supervision

### **1993**

Paul Glenn, undergraduate thesis, University of Toronto.  
James Rootham, undergraduate research, University of Toronto.  
Patrick Tierney, undergraduate research, University of Toronto.  
Quaid Morris, undergraduate research, University of Toronto.  
Alexander Budanitsky, undergraduate research, University of Toronto.

### **1998**

John Hale, Brown University, undergraduate summer intern, 1998, NEC Research Institute.

### **2001**

Curran Nachbar, Brown University, undergraduate summer intern, 2001, NEC Research Institute.

### **2002**

Abhilasha Bhargav, undergraduate summer intern, 2002, ECE49600, Fall 2002, Purdue University.  
Blake Matheny, undergraduate summer intern, 2002, 2003, undergraduate research, Fall 2002–Spring 2003, Purdue University.  
James J. Sherman, Jr., undergraduate summer intern, 2002, undergraduate research, Fall 2002–Spring 2003, SURF, 2003, Purdue University.  
Vamsi Vytla, undergraduate summer intern, 2002, undergraduate research, Fall 2002–Spring 2003, SURF, 2003, Purdue University.  
Keith Henderson, ECE49600, Fall 2002, Purdue University.

### **2003**

Bingrui Foo, undergraduate summer intern, 2003, undergraduate research, Fall 2003, Purdue University.  
Pranay Gupta, undergraduate summer intern, 2003, Purdue University.

### **2005**

Jeremy Tryba, undergraduate research, Fall 2005–Spring 2006, Purdue University.

### **2006**

Rajat Agarwal, undergraduate research, January–November 2006, Purdue University.  
Andrei Barbu, University of Waterloo, SURF, 2006, Purdue University.  
Sarah Fortune, Trinity College Dublin, SURF, 2006, Purdue University.  
Shammi Didla, SURF, 2006, Purdue University.

### **2007**

Iheukwumere Onwuka, University College London, undergraduate research, Fall 2007–Spring 2008, ECE49600, Fall 2007, Purdue University.  
Ross Beranek, ECE49600, Fall 2007, Purdue University.

### **2008**

Anchal Dube, SURF, 2008, undergraduate research, Fall 2008–Spring 2009, Purdue University.

### **2009**

Brian Jay Thomas, SURF, 2009, undergraduate research, Fall 2009–Spring 2010, Purdue University.  
Isaac P. Jones, SURF, 2009, Purdue University.

### **2010**

Seongwoon Ko, ECE49600, Fall 2010, Purdue University.

Alexander Bridge, undergraduate research, December 2010–January 2011, Purdue University.

Dan Coroian, undergraduate research, December 2010–January 2011, Purdue University.

Sam Mussman, undergraduate research, December 2010–January 2011, Purdue University.

Lara Schmidt, undergraduate research, December 2010–January 2011, Purdue University.

Jiangnan Shangguan, undergraduate research, December 2010–January 2011, Purdue University.

Jinliang Wei, undergraduate research, December 2010–January 2011, Purdue University.

Yifan Yin, undergraduate research, December 2010–January 2011, Purdue University.

**2011**

Zachary J. Burchill, University of Pennsylvania, undergraduate summer intern, 2011, 2012, 2013, 2014, Purdue University.

**2013**

Jordan R. Glassley, ECE47300, Spring 2013, honors contract, Purdue University.

**2014**

Colin Graber, ECE47300, Spring 2014, honors contract, ECE49600, Spring 2015, Purdue University.

**2015**

Evgeny Grunin, CS49000, Fall 2015, Purdue University.

Seth J. Benjamin, Columbia University, undergraduate summer intern, 2015, Purdue University.

Stephen Michael James Bulley, undergraduate research, 2015, Purdue University.

Jun He, undergraduate research, 2015, Purdue University.