

Jacob Goldberger - Curriculum Vitae

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Personal Data

Office: Bar-Ilan University, Bldg 1103, Room 422.
Phone: +972-3-5317053 (office), +972-544-321831 (cellular)
Email address: <mailto:jacob.goldberger@biu.ac.il>
home-page: <http://www.eng.biu.ac.il/goldbej/>

Education

- 2003 – 2004 Post-Doc, University of Toronto.
- 1999 Post-Doc, Weizmann Institute.
- 1995 – 1998 Ph.D. in Electrical Engineering, Tel-Aviv University.
Supervisor: Prof. David Burshtein, Thesis: Random trajectory segmental modeling for improved automatic speech recognition.
- 1987 – 1989 M.Sc. in mathematics, Tel-Aviv (cum laude)
Supervisor: Prof. Meir Smorodinsky, Thesis: The entropies of renewal systems.
- 1982 – 1984 B.Sc. in mathematics and computer science, Bar-Ilan University (summa cum laude).

Awards

- 2011 ACL conference best student long paper award (with Jonathan Berant and Ido Dagan).
- 2009 Winner of the ImageCLEF 2009 medical annotation task (with Uri Avni and Hayit Greenspan).
- 1997 ‘Excellent student paper’ award in Eurospeech97 conference.

Professional Experience

- 2004 – Faculty member, Faculty of Engineering, Bar-Ilan University.
- 2003 – 2004 Machine learning group, University of Toronto, Canada.
- 2000 – 2002 CUTe Ltd. Wireless video streaming, Vice President R&D.
- 2000 INRIA Rhone-Alpes Grenoble, France, MOVI project.
- 1999 Mate Ltd. Head of the audio department. Research in speaker spotting.
- 1998 CogniTens Ltd. Research staff member. Research in the area of vision, mainly image reconstruction.
- 1996 SRI international fellow, speech technology laboratory, USA.
- 1992 – 1995 A.R.T. Ltd. Research in the areas of handwriting and speech recognition. Manager of the speech recognition department.
- 1985 – 1990 The Israeli Defense Forces, researcher.

Research Interests

Research Interests: Statistical machine learning and information theory with applications to computer vision, medical imaging, error correcting codes, wireless communication and natural language processing.

Past students

- Shiri Gordon (M.Sc. joint with H. Greenspan), Unsupervised image clustering using probabilistic continuous models and information theoretic principles, 2005.
- Arnaldo Mayer (M.Sc. joint with H. Greenspan), A Probabilistic framework for spatio-temporal video representation and indexing, 2005.
- Amit Ruf, (M.Sc. joint with H. Greenspan), MR brain image segmentation, 2006.
- Rotem Natan (M.Sc. project), Automatic solution for Sudoku using algorithms on graphs, 2006.
- Omer Rotem (M.Sc. joint with H. Greenspan), Combining region and edge cues for image segmentation in a probabilistic Gaussian mixture framework, 2007.
- Oren Freifeld (M.Sc. joint with H. Greenspan), Lesion detection in noisy MR brain images using constrained GMM and active contours, 2007, currently a Ph.D. student at Brown University.
- Jeremie Dreyfuss (M.Sc. joint with H. Greenspan), Reduced GMM for medical data classification, 2007.
- Tomer Belkind, (M.Sc. project, joint with H. Greenspan) Video Google: Efficient search of videos, 2009.
- Sivan Zommer (M.Sc. project, joint with M. Koppel), Empirical study of various methods for weighted bagging, 2009.
- Moshe Taieb (M.Sc. joint with M. Koppel), The Netflix rating data-base, 2009.
- Amir Alush (M.Sc. joint with H. Greenspan), Automatic landmark detection in uterine cervix medical images, 2009.
- Anat Helpert (M.Sc. joint with Y. Shavitt), Clustering anonymous nodes in the internet graph, 2009.
- Uri Avni (M.Sc. joint with H. Greenspan), Efficient Retrieval in large medical image datasets, 2009.
- Lev Faivishevsky, Ph.D., Efficient computation of information theoretic entities with applications to machine learning, 2011.
- Avishay Friedman, M.Sc., Information theoretic pairwise clustering, 2012.

- Sharon Nissimov, M.Sc. (joint with Victor Alchanati), Obstacle detection in a greenhouse environment using the Kinect sensor, 2013.

Current Students

- Idir Diamant, Ph.D. (joint with H. Greenspan).
- Eyal Shnarch, Ph.D. (joint with I. Dagan).
- Amir Alush, Ph.D.
- Oren Melamud, Ph.D. (joint with I. Dagan).

Undergraduate Students Supervised: Dan Miller, Roni Brami, Israel Sagiv, Moshe Zarian (2005), Chen Koker, Maytal Toledano, Shuki Zanyovka, Yehuda Yehudai, Ophir Ilya, Tali Kriksman (2006), Roi Noy, Ronen Katan (2007), Guri Kamelo, Aviv Shalom, Mordechai Eligal, Uria Asher (2008), Liad Smargad, Michael Tsohar, Arik Fried, Ariel Kasirer (2009), Elad Rosenblum, Jonathan Katz, Imanuel Ben-Baruch, Ziv Luzon (2010), Yair Porat, Meir Grossman (2012).

Publications

Journal Papers

1. Amir Alush and Jacob Goldberger, “Ensemble segmentation using efficient integer linear programming”, *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol 34:10, pp. 1966-1977, 2012.
2. Lev Faivishevsky and Jacob Goldberger, “Dimensionality reduction based on non-parametric mutual information”, *Neurocomputing*, vol. 80, pp. 31-37, 2012.
3. Eyal Baharad, Jacob Goldberger, Moshe Koppel and Shmuel Nitzan, “Beyond Condorcet: Optimal aggregation rules using voting records”, *Theory and Decision*, vol. 72, pp. 113-130, 2012.
4. Jonathan Berant, Ido Dagan and Jacob Goldberger, “Learning entailment relations by global graph structure optimization”, *Computational Linguistics*, vol 38:1, pp. 1-39, 2012.
5. Lev Faivishevsky and Jacob Goldberger, “An unsupervised data projection that preserves the cluster structure”, *Pattern Recognition Letters*, vol. 33, pp. 256-262, 2012.
6. Jacob Goldberger and Amir Leshem, “Iterative tomographic solution of integer least squares problems with applications to MIMO detection”, *IEEE Journal of Selected Topics in Signal Processing*, vol. 5, pp. 1486-1496, 2011.

7. Jacob Goldberger and Amir Leshem, "MIMO detection for high-order QAM based on a Gaussian tree approximation", *IEEE Trans. Information Theory*, vol. 57, pp. 4973-4982, 2011.
8. Uri Avni, Hayit Greenspan, Eli Konen, Michal Sharon, and Jacob Goldberger, "X-ray categorization and retrieval on the organ and pathology level, using patch-based visual words", *IEEE Trans. Medical Imaging*, vol. 30, pp. 733-746, 2011.
9. Eyal Baharad, Jacob Goldberger, Moshe Koppel and Shmuel Nitzan, "Distilling the wisdom of crowds: Weighted aggregation of decisions on multiple issues", *Autonomous Agents and Multi-Agents Systems*, vol. 22, pp. 31-42, 2011.
10. Jacob Goldberger and Tamir Tassa, "Efficient anonymizations with enhanced utility", *Transactions on Data Privacy*, vol. 3, pp. 149-175, 2010.
11. Amir Alush, Hayit Greenspan and Jacob Goldberger, "Automated and interactive lesion detection and segmentation in uterine cervix Images", *IEEE Trans. Medical Imaging*, Vol. 29, pp. 488-501, 2010.
12. Keren Erez, Jacob Goldberger, Ronen Sosnik, Moshe Shemesh, Susan Rothstein, and Moshe Abeles, "Analyzing movement trajectories using a Markov bi-clustering method", *Journal of Computational Neuroscience*, Vol 27, pp. 543-552, 2009.
13. Lior Weizman and Jacob Goldberger, "Classification of hyperspectral remote-sensing images using discriminative linear projections", *International Journal of Remote Sensing*, Vol. 30, Issue 21, pages 5605-17, 2009.
14. Oren Freifeld, Hayit Greenspan and Jacob Goldberger, "Multiple sclerosis lesion detection using constrained GMM and curve evolution", *International Journal of Biomedical Imaging*, doi:10.1155/2009/715124, 2009.
15. Lior Weizman and Jacob Goldberger, "Urban area segmentation using visual words", *IEEE Geoscience and Remote Sensing Letters*, Vol. 6, no. 3, pp. 388-392, 2009.
16. Jacob Goldberger, Hayit Greenspan and Jeremie Dreyfuss, "Simplifying mixture models using the unscented transform" *IEEE Trans. Pattern Analysis and Machine Intelligence*, Vol 30, pp. 1496-1502, 2008.
17. Jacob Goldberger and Tamir Tassa, "A hierarchical clustering algorithm based on the Hungarian method", *Pattern Recognition Letters* 29, pages 1632-38, 2008.
18. Moshe Butman and Jacob Goldberger, "Face recognition using classification based linear projections", *EURASIP Journal on Advances in Signal Processing*, Volume 8, Issue 2, 2008.
19. Joel Pinhas, Victoria Soroker, Amots Hetzroni, Amos Mizrach, Mina Teicher and Jacob Goldberger, "Automatic acoustic detection of the red palm weevil", *Computers and Electronics in Agriculture*, pages 131-139, 2008.

20. Jacob Goldberger and Haggai Kfir, "Serial schedules for belief-propagation: analysis of convergence time", *IEEE Trans. Information Theory*, pp. 1316-19, 2008.
21. Eran Sharon, Simon Litsyn and Jacob Goldberger, "Efficient serial message -passing schedules for LDPC decoding", *IEEE Trans. Information Theory*, pp. 4076-91, 2007.
22. Hayit Greenspan, Amit Ruf and Jacob Goldberger, "Constrained Gaussian mixture model framework for automatic segmentation of MR brain images", *IEEE Trans. Medical Imaging*, pp. 1233-45, 2006.
23. Jacob Goldberger, Hayit Greenspan and Shiri Gordon, "Unsupervised image-set clustering using an information theoretic framework", *IEEE Trans. on Image Processing*, vol. 15, pp. 449-458, 2006.
24. Jacob Goldberger and Hayit Greenspan, "Context-based segmentation of image sequences", *IEEE Pattern Analysis and Machine Intelligence*, vol. 28, pp. 463-468, 2006.
25. Jacob Goldberger, "Projective reconstruction from pairwise overlapping multiple views", *Journal of Computer Vision and Image Understanding*, Vol. 97, pp. 283-296, 2005.
26. Hayit Greenspan, Jacob Goldberger and Arnaldo Mayer, "Probabilistic space-time video modeling via piecewise GMM", *IEEE Pattern Analysis and Machine Intelligence*, Vol 26, pp. 384-396, 2004.
27. Hayit Greenspan, Jacob Goldberger and Lenny Riddell, "A continuous probabilistic framework for image matching", *Journal of Computer Vision and Image Understanding* 84, pp. 384-406, 2001.
28. Hayit Greenspan, Jacob Goldberger and Itay Eshet, "Mixture model for face color modeling and segmentation", *Pattern Recognition Letters* 22, pp. 1525-1536, 2001.
29. Jacob Goldberger, David Burshtein and Horacio Franco, "Segmental modeling using a continuous mixture of non-parametric models", *IEEE Trans. Speech Audio Proc.*, vol. 7, pp. 262-271, 1999.
30. Jacob Goldberger and David Burshtein, "Scaled random trajectory segmental models", *Computer Speech and Language* 12, pp. 51-73, 1998.
31. Jacob Goldberger, Douglas Lind and Meir Smorodinsky, "The entropies of renewal systems", *Israel Journal of Mathematics* 75, pp. 49-64, 1991.

Book Chapters

32. Uri Avni, Jacob Goldberger, Hayit Greenspan, "Medical image classification at Tel-Aviv and Bar-Ilan universities", in *ImageCLEF: Experimental Evaluation in Visual Information Retrieval*, edited by H. Muller, P. Clough and T. Deselaers, Springer, 2010.

International Conference Papers

33. Oren Melamud, Jonathan Berant, Ido Dagan, Jacob Goldberger and Idan Szpektor. “A two level model for context sensitive inference rules”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, Sofia, 2013.
34. Oren Melamud, Ido Dagan, Jacob Goldberger and Idan Szpektor, “Using lexical expansion to learn inference rules from sparse data”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, short paper, Sofia, 2013.
35. Eyal Shnarch, Erel Segal-Halevi, Ido Dagan and Jacob Goldberger, “PLIS: a probabilistic lexical inference system”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, Sofia, 2013.
36. Jacob Goldberger, “Improved MIMO detection based on successive tree approximations”, *IEEE Int. Symposium on Information Theory (ISIT)*, Istanbul, 2013.
37. Amir Alush and Jacob Goldberger, “Break and conquer: efficient correlation clustering for image segmentation”, *Int. Workshop on Similarity-Based Pattern Analysis and Recognition (SIMBAD)*, York, 2013.
38. Avishay Friedman and Jacob Goldberger, “Information theoretic pairwise clustering”, *Int. Workshop on Similarity-Based Pattern Analysis and Recognition (SIMBAD)*, York, 2013.
39. Idit Diamant, Hayit Greenspan and Jacob Goldberger, “Breast tissue classification in mammograms using visual words”, *SPIE Medical Imaging*, Orlando, 2013.
40. Lev Faivishevsky and Jacob Goldberger, “Unsupervised feature selection based on non-parametric mutual information”, *IEEE Machine Learning for Signal Processing Workshop, (MLSP)*, Spain, 2012.
41. Jonathan Berant, Ido Dagan, Meni Adler and Jacob Goldberger, “Efficient tree-based approximation for entailment graph learning”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, Korea, 2012.
42. Eyal Shnarch, Ido Dagan and Jacob Goldberger, “A probabilistic lexical model for ranking textual inferences”, **SEM Conference on Lexical and Computational Semantics*, Montreal, 2012.
43. Uri Avni, Hayit Greenspan and Jacob Goldberger, “X-ray categorization and spatial localization of chest pathologies”, *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Toronto, 2011.
44. Eyal Shnarch, Jacob Goldberger and Ido Dagan, “Towards a probabilistic model for lexical entailment”, *TextInfer-Workshop on Textual Entailment*, Edinburgh, 2011.
45. Eyal Shnarch, Jacob Goldberger and Ido Dagan, “A probabilistic modeling framework for lexical entailment”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, short paper, Portland, 2011.

46. Jonathan Berant, Ido Dagan and Jacob Goldberger, “Global learning of typed entailment rules”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, Portland, 2011. **Received the best student long paper award.**
47. Uri Avni, Hayit Greenspan, Eli Konen, Michal Sharon and Jacob Goldberger, “System for pathology categorization and retrieval in chest radiographs”, *SPIE Medical Imaging*, Florida, 2011.
48. Michal Sharon, Uri Avni, Jacob Goldberger, Eli Konen and Hayit Greenspan, “A Novel automated software for identification of Abnormal chest films using the bag of words model”, in Radiological Society of North America (RSNA), Chicago, 2010.
49. Lev Faivishevsky and Jacob Goldberger, “Mutual information based dimensionality reduction with application to non-linear regression”, *IEEE Machine Learning for Signal Processing Workshop, (MLSP)*, Kittila, Finland, 2010.
50. Jonathan Berant, Ido Dagan and Jacob Goldberger “Global learning of focused entailment graphs”, *Annual Meeting of the Association for Computational Linguistics (ACL)*, Uppsala, 2010.
51. Lev Faivishevsky and Jacob Goldberger, “A nonparametric information theoretic clustering algorithm”, *International Conference Machine Learning (ICML)*, Haifa, 2010.
52. Uri Avni, Jacob Goldberger, Michal Sharon, Eli Konen, Hayit Greenspan, “Chest X-ray characterization: From the organ identification to the pathology categorization”, *ACM Int. Conference on Multimedia Information Retrieval (MIR)*, Philadelphia, 2010.
53. Jacob Goldberger and Amir Leshem, “Pseudo prior belief propagation for densely connected discrete graphs” *IEEE Information Theory Workshop (ITW)*, Cairo, 2010.
54. Jacob Goldberger and Amir Leshem, “A Gaussian tree approximation for integer least-squares”, *Neural Information Processing Systems 23 (NIPS)*, Vancouver, 2009.
55. Jacob Goldberger and Tamir Tassa, “Efficient anonymizations with enhanced utility”, *International Workshop on Privacy Aspects of Data Mining (PADM)*, Miami, 2009.
56. Uri Avni, Jacob Goldberger and Hayit Greenspan, “Addressing the ImageClef 2009 Challenge using a patch-based visual words”, *The Cross Language Evaluation Forum Workshop (CLEF)*, Corfu, 2009, **Winner of the CLEF medical image annotation challenge.**
57. Amir Alush, Hayit Greenspan and Jacob Goldberger, “Automated and interactive lesion detection and segmentation using an arc-level MRF”, *IEEE International Symposium on Biomedical Imaging (ISBI)*, Boston, 2009.
58. Uri Avni, Hayit Greenspan, Michal Sharon, Eli Konen and Jacob Goldberger, “X-ray image categorization and retrieval using patch-based visual words representation”, *IEEE International Symposium on Biomedical Imaging (ISBI)*, Boston, 2009.

59. Amir Leshem and Jacob Goldberger, "MIMO decoding based on stochastic reconstruction from multiple projections", *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, Taipei, 2009.
60. Anat Almog, Jacob Goldberger and Yuval Shavitt, "Unifying unknown nodes in the internet graph using semisupervised spectral clustering", *The International Workshop on Mining Complex Data (MCD)*, Pisa, 2008.
61. Lev Faivishevsky and Jacob Goldberger, "ICA based on a smooth estimation of the differential entropy", *Neural Information Processing Systems 22 (NIPS)*, Vancouver, 2008.
62. Lior Weizman and Jacob Goldberger, "Detection of urban zones in satellite images using visual words", *SPIE Int. Geoscience and Remote Sensing Symposium (IGARSS)*, Boston, 2008.
63. Idan Szpektor, Ido Dagan, Roy Bar Haim and Jacob Goldberger, "Contextual preferences", *Annual Meeting of the Association for Computational Linguistics (ACL)*, 2008.
64. Jacob Goldberger, Keren Erez and Moshe Abeles, "A Markov clustering method for analyzing movement trajectories", *IEEE Machine Learning for Signal Processing Workshop (MLSP)*, Thessaloniki, 2007.
65. Jaakko Peltonen, Jacob Goldberger and Samuel Kaski, "Fast semi-supervised discriminative component analysis", *IEEE Machine Learning for Signal Processing Workshop (MLSP)*, Thessaloniki, 2007.
66. Lior Weizman and Jacob Goldberger, "A classification based linear projection of labeled Hyperspectral data", *SPIE Int. Geoscience and Remote Sensing Symposium (IGARSS)*, Barcelona, 2007.
67. Omer Rotem, Hayit Greenspan and Jacob Goldberger, "Combining region and edge cues for image segmentation in a probabilistic Gaussian mixture framework", *IEEE Computer Vision and Pattern Recognition (CVPR)*, Minneapolis, 2007.
68. Jacob Goldberger, Hayit Greenspan and Jeremie Dreyfuss, "An optimal reduced representation of a MoG with applications to medical image database classification", *IEEE Computer Vision and Pattern Recognition (CVPR)*, Minneapolis, 2007.
69. Oren Freifeld, Hayit Greenspan and Jacob Goldberger, "Lesion detection in noisy MR brain images using constrained GMM and active contours", *IEEE International Symposium on Biomedical Imaging (ISBI)*, Washington DC, 2007.
70. Eran Sharon, Simon Litsyn and Jacob Goldberger, "Convergence analysis of serial message-passing schedules for LDPC decoding", *The International Symposium on Turbo Codes*, Munich, 2006.

71. Jacob Goldberger and Hagai Aronowitz, "A distance measure between GMMs based on the unscented transform and its application to speaker recognition", Eurospeech-Interspeech, Lisbon, 2005.
72. Amit Ruf, Hayit Greenspan and Jacob Goldberger, "Tissue classification of noisy MR brain images using constrained GMM", *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, 2005.
73. Eran Sharon, Simon Litsyn and Jacob Goldberger, "An efficient message-passing schedule for LDPC decoding", The IEEE convention of Electrical Engineering, Israel, 2004.
74. Jacob Goldberger, Sam Roweis, Geoff Hinton and Ruslan Salakhutdinov, "Neighbourhood component analysis", *Neural Information Processing Systems 18 (NIPS)*, Vancouver, 2004.
75. Jacob Goldberger and Sam Roweis, "Hierarchical clustering of a mixture model", *Neural Information Processing Systems 18 (NIPS)*, Vancouver, 2004.
76. Jacob Goldberger, Hayit Greenspan and Shiri Gordon, "An efficient similarity measure based on approximations of KL-divergence between two Gaussian mixtures", *International Conference on Computer Vision (ICCV)*, Nice, 2003.
77. Shiri Gordon, Jacob Goldberger and Hayit Greenspan, "Applying the information bottleneck principle to unsupervised clustering of discrete and continuous image representations", *International Conference on Computer Vision (ICCV)*, Nice, 2003.
78. Hayit Greenspan, Shiri Gordon and Jacob Goldberger, "Probabilistic models for generating, modeling and matching image categories", *International Conference on Pattern Recognition (ICPR)*, Quebec, 2002.
79. Hayit Greenspan, Jacob Goldberger and Arnaldo Mayer, "A probabilistic framework for spatio-temporal video representation and indexing", *European Conference on Computer Vision (ECCV)*, Copenhagen, 2002.
80. Jacob Goldberger, Hayit Greenspan and Shiri Gordon, "Unsupervised image clustering using the information bottleneck method", The Annual Pattern Recognition Conference DAGM, Zurich, 2002.
81. Dennis Nilsson and Jacob Goldberger, "Sequentially finding the N-best list in hidden Markov models", *International Conference on Artificial Intelligence (IJCAI)*, Seattle, 2001.
82. Jacob Goldberger, "Registration of multiple point sets using the EM algorithm", *International Conference on Computer Vision (ICCV)*, Corfu, 1999.
83. Jacob Goldberger and David Burshtein, "Scaled random trajectory segmental models", *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, Seattle, 1998.

84. Jacob Goldberger, David Burshtein and Horacio Franco, "Segmental modeling using a continuous mixture of non-parametric models", EuroSpeech, Crete, 1997.

Patents (can be found in <http://www.uspto.gov/patft/index.html>)

1. Gabriel Ilan and Jacob Goldberger, "Pattern recognition system", U.S. patent 6-195-638, 2001.
2. Tamir Shalom, Ilan Zelnik and Jacob Goldberger, "System and method for stitching a plurality of reconstructions of three-dimensional surface features of objects in a scene defined relative to respective coordinate systems to relate them to a common coordinate system", U.S. patent 6-201-541, 2001.
3. Gabriel Ilan and Jacob Goldberger, "Handwritten pattern recognizer with selective feature weighting", U.S. patent 6-023-529, 2000.
4. Gabriel Ilan and Jacob Goldberger, "Pattern recognition system", U.S. patent 5-809-465, 1998.

Grants

MAFAT, "Content based image retrieval", 200K NIS. Joint grant with Hayit Greenspan, TAU, 2006.

Ministry of Science Grant for Strategic Research directions (Mechkar Tashtiti), "Development of innovative computerized tools for brain MRI segmentation and image analysis in multiple sclerosis" Joint grant with Hayit Greenspan TAU and the MS unit of Tel-Hashomer, 97K\$ per year, 2006-2008.

Compositionality in brain processes: toward a language-based model of analyzing drawing behavior in monkeys, Center for Complexity Science (CCS) jointly with Moshe Abeles and Susan Rothstein, 30K\$ a year for three years. 2008-2010.

Object detection in satellite images, Mafaat (Israel Ministry of Defense), one year, 100K NIS, 2008.

The FP6 European network of excellence Pattern Analysis, Statistical modeling and Computational Learning (PASCAL).

The FP7 program network of excellence Pattern Analysis, Statistical modeling and Computational Learning (PASCAL2).

ISF grant, Integrative learning of lexical inference knowledge, (joint with Ido Dagan), 2012-2015.

Short Term Visits

- University of Chicago, TTI institute, August, 2012.
- University of Toronto, September, 2010.
- University of Chicago, TTI institute, August, 2009.
- University College of London, September, 2008.
- Helsinki University of Technology, August, 2006.
- University of Toronto, August, 2005.
- INRIA Rhone-Alps, Grenoble, January-April, 2000.

Invited talks

- General Motors Research, Israel, 2013.
- Google Research Tel-Aviv, 2012.
- Ecole de Physique des Houches, France, 2012.
- University of Chicago, TTI institute, 2012.
- Yahoo Research Lab, Haifa, 2011.
- The Open University, Israel, Computer Science seminar, 2009.
- Hebrew University, Machine learning seminar, 2009.
- Tel-Aviv University, Engineering Colloquium, 2009.
- University of Chicago, TTI institute, 2009.
- Ben-Gurion University, Electrical Engineering seminar, 2009.
- University College of London, Machine Learning seminar, 2008.
- Helsinki University of Technology, Machine Learning seminar, 2006.
- Weizmann Institute, Vision and Robotic seminar, 2006.
- Hebrew University, Machine learning seminar, 2006.
- Tel-Aviv University, Engineering Colloquium, 2005.
- University of Toronto, Machine Learning Group seminar, 2003.
- INRIA Grenoble, MOVI group seminar, 2000.

- Weizmann Institute, Vision and Robotic seminar, 1999.
- Tel-Aviv University, Engineering Colloquium, 1998.
- MIT, Computational learning seminar, 1998.
- SRI international, USA, speech group seminar, 1996.

Teaching Experience

- Linear Systems, Bar-Ilan University, 2013.
- Random Signals and noise, Bar-Ilan University, 2005-2012.
- Image Processing, Bar-Ilan University, 2005-present.
- Information Theory, The Weizmann Institute, 2002.
- Information Theory, Hebrew University, 2003.
- Information Theory, Bar-Ilan University, 2005-2009.
- Statistical machine Learning, The Weizmann Institute, 2003.
- Statistical machine Learning, Bar-Ilan University, 2006, 2009-present.

Program Committee Member

- Neural Information Processing Systems (NIPS) (2004,2008,2009,2012)
- International Conference Machine Learning (ICML) (2007,2008,2009,2011)
- Conference on Uncertainty in Artificial Intelligence (UAI) (2005)
- International Conference on Artificial Intelligence and Statistics (AISTAT) (2009)
- International Conference on Computer Vision (ICCV) (2007)
- European Conference on Computer Vision (ECCV) (2006,2008,2010)
- IEEE Computer Vision and Pattern Recognition (CVPR) (2000,2009,2011)
- International Conference on Pattern Recognition (ICPR) (2008)