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CURRICULUM VITAE

Ron Shamir

December 2016

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Personal Data

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Born:	Nov. 29, 1953, Jerusalem, Israel
Married:	Michal Oren-Shamir, September 8 1982
Children:	Alon Shamir February 12 1985
	Ittai Shamir April 25 1988
	Yoav Shamir December 29 1993

Education

University of California, Berkeley, USA (1981-1984)

> Ph.D., Operations Research. Advisors: Richard M. Karp and Ilan Adler

Tel Aviv University (1978-1981)

> M.Sc. Operations Research. Advisor: Uri Yechiali (completed at U. C. Berkeley)

The Hebrew University, Jerusalem (1975-1977)

> B.Sc. Mathematics and Physics

Tel Aviv University (1973-1975)

> B.Sc. Mathematics and Physics (completed at the Hebrew University)

Current Research Interests

Bioinformatics / Computational molecular biology.

> *Computational genomics, gene regulation, systems biology, genome rearrangements, human disease, integrative analysis of heterogeneous high throughput biological data, Bioinformatics education.*

Design and analysis of algorithms.

Algorithmic graph theory.

Academic appointments

Professor (2000-today)

> Tel Aviv University, School of Computer Science

Associate professor (1995-2000)

> Tel Aviv University, School of Computer Science

Senior Lecturer (1990-1995)

> Tel Aviv University, School of Mathematics, Department of Computer Science

Lecturer; Alon fellow (1987-1989)

> Tel Aviv University, School of Mathematics, Department of Computer Science

Visiting appointments

Visiting professor (March 2009)
> University of California, San Diego, Department of Computer Science and Engineering.

Visiting Mackay professor (Fall 2008)
> University of California, Berkeley, Department of Electrical Engineering and Computer Science

Visiting professor (2003)
> The Weizmann Institute of Science, Rehovot, Israel

Visiting associate professor (1998)
> University of Washington, Department of Computer Science and Department of Molecular Biotechnology

Visiting scholar (Feb. 1997, summer 1997)
> International Computer Science Institute, Berkeley CA

Visiting research assistant professor (Sept. 1989-Aug. 1991)
> Rutgers University - Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) and Rutgers Center for Operations Research (RUTCOR)

Visiting research assistant professor(Oct. 1987, Sept.-Oct. 1988, Dec. 89-Jan. 90, March 91)
> U.C. Berkeley, Department of Industrial Engineering and Operations Research.

Visiting scholar (Sept. 1987)
> University of Minnesota, Institute of Mathematics and its Applications

Awards

RECOMB 2016 "Test of Time Award", for the 2004 paper "Identification of protein complexes by comparative analysis of yeast and bacterial protein interaction data" (with R. Sharan, T. Ideker, B. Kelley, and R. M. Karp).

Fellow, the Association for Computing Machines, 2012.

Fellow, the International Society for Computational Biology, 2012.

Tel Aviv University Prize for Research Excellence in the Sciences, 2011.

Landau Prize in Bioinformatics, 2011 (a national prize awarded by the Israeli Lottery Organization for achievements in science and research).

RECOMB 2011 "Test of Time Award", for the 1999 paper "Clustering Gene Expression Patterns" (with A. Ben-Dor and Z. Yakhini).

The Raymond and Beverly Sackler Chair in Bioinformatics, Tel Aviv University, November 2003.

Best Paper Award, ISMB 2000 (For "Spectrum Alignment", with I. Pe'er)

Alon Fellowship, Israel, 1987.

Weizmann Postdoctoral Scholarship, Israel 1986. (*)

Eshkol Postdoctoral Scholarship, Israel 1986. (*)

Nomination to the yearly award for dissertation in the sciences, U.C. Berkeley, 1984.

John H. Wheeler and Elliot H. Wheeler Fellowship, U.C. Berkeley, 1981. (*)

Three University Awards and Scholarships, Tel Aviv University, 1978-1980

(*) these fellowships were awarded but not used.

Administrative Activities

- Member, committee for nominating the chairman of the Executive Council, Tel Aviv University, 2012.
- Academic member, Board of Governors, Tel Aviv University, 2011–13.
- Member, committee for the selection of the nominee for chairman of the Board of Governors, Tel Aviv University, 2012.

- Member, committee for the selection of the nominee for president, Tel Aviv University, 2009.
- **Head, School of Computer Science**, Tel Aviv University 2004–2006.
- **Head, Edmond J. Safra Center for Bioinformatics**, Tel Aviv University 2005–
- **Founding head**, Tel Aviv University B.Sc. program in Bioinformatics, 2000–2002.
- Head, the Mathematical Institute, School of Mathematics, Tel Aviv University, 1995–1997, 2001–2004, 2006.

Editorial Responsibilities

- *Journal of Computational Biology*: Editorial Board member 1994-1997; Associate Editor since 1997.
- *Discrete Applied Mathematics series on Computational Molecular Biology*: Co-editor since 1994.
- *Journal of Computer and System Sciences*: Associate Editor 1997-2014.
- *Discrete Applied Mathematics*: Editorial Board member since 1999.
- *SIAM Journal on Discrete Mathematics*: Editorial Board member 2003-2008.
- *Journal of Computer and System Sciences*: Special series of issues on Computational Biology, co-editor 2001-2014.
- *SIAM monographs series on Discrete Mathematics and applications*: Editorial Board member since 1996.
- *Kluwer Book Series in Computational Biology*: Advisory Board member since 1999.
- *Lecture Notes in Bioinformatics*: Editorial Board member since 2003.
- *IEEE/ACM Transactions on Computational Biology and Bioinformatics*: Editorial board member 2004-2008.
- *Communications of the ACM*: Editorial board member since 2007.
- *BMC Bioinformatics*: Editorial board member 2010-2016.

Conference Committees

- *RECOMB, International Conference on Computational Molecular Biology*,
     Program committee (PC) chair, 2000, PC member, 1997, 1998, 1999, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2011.
- *ISMB, International Conference on Intelligent Systems for Molecular Biology*,
     PC member, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015
- *RECOMB Satellite Conference on Bioinformatics Education*,
     co-founder, steering committee member 2009- ; co-chair 2009, 2010, 2011, 2012.
- *RECOMB Satellite Conference on Systems Biology*,
     Steering committee member, 2006- ; PC member, 2006, 2007.
- *RECOMB Satellite Conference on Regulatory Genomics*,
     PC member, 2008, 2009, 2010, 2011, 2012, 2013, 2014
- *RECOMB/ISCB Satellite Conference on Regulatory and Systems Genomics with DREAM challenges*,
     PC member, 2015
- *IBS, Israeli Bioinformatics Symposium*:
     PC chair, 1995, 2005, 2006; PC member, 2004, 2008.
- *ECCB, European Conference on Computational Biology*,
     PC member, 2002, 2003, 2006. Steering committee member, 2006.
- *Genomic Medicine meeting*, Saigon, Vietnam, PC member, 2015
- *PSB, Pacific Symposium on Biocomputing*, PC member, 2013.
- *CASB-20 Conference on Comparative Genomics*, **co-chair**, 2009, 2010.
- *ILANIT (FISEB) conference*, scientific committee member, 2011.
- *Asia-Pacific Bioinformatics Conference*, PC member, 2009.
- *ESF Workshop on Non-Coding RNAs: Computational Challenges and Applications*, PC member, 2008.
- *Third Bertinoro Computational Biology Meeting*, **co-organizer**, 2005.

- *Third Haifa Workshop on Interdisciplinary Applications of Graph Theory, Combinatorics and Computing*, PC member, 2003.
- *NATO Advanced Studies Institute on Artificial Intelligence and Heuristic Methods for Bioinformatics*, **co-director**, 2001.
- *WABI, Workshop on Algorithms in Bioinformatics*, PC member, 2001.
- *Symposium on Human Genetics in the Post-Genomic Age*, Maagan, Israel, PC member, 2000.
- *SIAM Conference on Discrete Mathematics*: Organizing committee member, 2004, PC member 1998.
- *CPM, Combinatorial Pattern Matching*, PC member, 1997, 1998.
- *Bat Sheva de Rothschild Seminar on Computational Aspects of the Human Genome Project*, Nahsholim, Israel, **chair**, 1996.
- *German-Israeli Symposium on Computer Science Aspects of Molecular Biology*, Tel Aviv University, Israeli **chair**, 1995.
- *ISTCS, Israeli Symposium on Theoretical Computer Science*, PC member, 1995.
- *Italian-Israeli Symposium on Algorithmic Methods in Molecular Biology*, Padova, Italy, **co-chair**,1994.
- *DIMACS Workshop on Combinatorial Structures in Molecular Biology*, Rutgers University, organizing committee member, 1994.
- *DIMACS / RUTCOR Workshop on Applications of Combinatorial Optimization in Science and Technology*, PC member, 1991.

Invited Lectures

1. "The linear programming problem: developments in the last decade". Invited tutorial, Operations Research Society of Israel (ORSIS) annual conference, Tel Aviv University, May 1985.
2. "On the efficiency of the Simplex method". Invited paper, EURO IX - TIMS XXVII Joint international conference, Paris, July 1988.
3. "Interval graphs, interval orders and the consistency of temporal events". Invited talk, Sixth SIAM Conference on Discrete Mathematics, Vancouver, Canada, June 1992.
4. "The buffer assignment problem". Invited talk, Sixth SIAM Conference on Discrete Mathematics, Vancouver, Canada, June 1992.
5. "How hard is the integration of physical maps?". Invited talk, 2nd Sandia National Labs workshop on computational molecular biology, Albuquerque, NM, March 1996.
6. "Algorithmic challenges in computational biology", The Bar-Ilan Computer Science Research Institute CS Forum - a distinguished lecture series, Bar-Ilan University, June 1996.
7. "An algorithm for clustering cDNAs for gene expression analysis using short oligonucleotide fingerprints". Invited presentation, Human Genome Meeting, Torino, Italy, March 1998.
8. "Computational tools for interpreting expression data from DNA arrays". **Keynote speaker**, *Spot-light on Proteomics and Computational Biology*, INN-2000 Symposium, May 25, 1999.
9. "Gene-clustering algorithm with visualization tools" *CHI Second Annual Conference on Integrated Bioinformatics: High-Throughput Interpretation of Genes and Proteins"*. Invited presentation, Zurich, Switzerland, 19-21 January 2000.
10. "Cluster analysis of gene expression data". Invited speaker, workshop on *Exploring the Genome with DNA Microarrays*, Boehringer Ingelheim Vienna Biocenter, Vienna, March 2000.
11. "Incomplete directed phylogeny: graph characterizations, sandwich formulations and an efficient algorithm". **Keynote speaker**, *Workshop on Structured Families of Graphs*, Fields Institute, Toronto, May 2000.
12. "Novel algorithms for gene expression analysis and DNA chips" *ESABIO Conference on Bioinformatics*, Paris, France, October 10 2000.
13. "DNA chips and algorithms: a spectrum of opportunities". Invited speaker, *Workshop on Expression*

Array Technologies and Methods of Analysis, Institute of Pure and Applied Mathematics, UCLA, October 12-15 2000.

14. "Algorithmic tools for gene expression analysis and novel utilizations of DNA Chips", *Symposium on Human Genetics in the Post-Genomic Age*, Maagan, Israel, November 2000.

15. "Algorithmic tools for expression analysis and novel utilizations of DNA Chips". Invited presentation, *CHI Third Annual Conference on Integrated Bioinformatics*. Zurich, Switzerland, January 2001.

16. "Computational problems in DNA microarrays: from gene expression analysis to pathways". Invited plenary talk, *Bioinformatics 2001* Skövde, Sweden, March 2001.

17. "Algorithmic problems in the Human Genome Project - and beyond". Invited plenary speaker, *Workshop on Interdisciplinary Applications of Graphs and Algorithms* Haifa University, April 17 2001.

18. "Analysis of gene expression data". Invited speaker, *Ernst Schering Research Foundation Workshop on Bioinformatics and Genome Analysis*, Berlin, June 17th-19th 2001.

19. "Resurrecting SBH". Invited speaker, *12th Annual Symposium on Combinatorial Pattern Matching* Jerusalem, Israel, 1-4 July, 2001.

20. "Computational analyses of gene expression data". Invited speaker, *FISEB 2002, The 3rd Federation of Israel Societies for Experimental Biology Congress*, Eilat, February 4th - 7th 2002.

21. "Computational techniques for DNA arrays: gene networks expansion and resequencing". Invited speaker, *MGED Satellite Meeting to the 2002 AAAS Annual Meeting and Science Innovation Exposition*, Boston, Mass, February 13-16 2002.

22. "Novel computational tools for functional genomics". Invited speaker, *Bio-Tech Israel 2002*, Israel National Biotechnology week, Tel Aviv, March 20-21 2002.

23. "The restriction scaffold problem". Invited speaker, *2002 Annual Meeting of ISTMB - The Israeli Society for Theoretical and Mathematical Biology*, Bar Ilan University, March 2002.

24. "Computational challenges in molecular biology in the post-genome era". Invited speaker, *2002 Annual Meeting of the Israeli Mathematical Union*l, Mitspe Ramon, May 9-10 2002.

25. "Analysis of microarray gene expression data". **Plenary speaker**, *Third Spanish Symposium on Bioinformatics and Computational Biology*, Salamanca, Spain, September 18th-20th 2002.

26. "Unraveling tight functional modules via microarry data". Invited talk, *German Israeli Fund (GIF) meeting on Challenges in Genomic Research, Neurodegenerative Diseases, Stem-Cells and Bioethics*, Heidelberg, July 8-10 2002.

27. "Reverse engineering of gene networks and regulatory signals", *Bat Sheva Interdisciplinary Workshop on Global Information in Biological Systems: The Emergence of Functional Organization*, Dead Sea, Israel, October 2002.

28. "Computational reconstruction of gene networks and regulatory signals", *Cell Systems Biology: A European Research Training Conference*, Berlin, Germany, November 2002.

29. "Computational analysis of diverse genome-wide experimental data". Invited speaker, Ĉonference on Genomics and Cancer: Integrating Genomics with Clinical Research and Therapy, The German Cancer Research Centre (DKFZ) Heidelberg, Germany, May 27, 2003.

30. "Computational challenges in molecular biology". Invited speaker, *International Conference on Formal Power Series and Algebraic Combinatorics* (FPSAC'03), Linkoping University, Sweden, June 23 – 27, 2003.

31. "Reconstructing Genetic Networks". **Plenary speaker**, *11th International Conference on Intelligent Systems for Molecular Biology* (ISMB '03), Brisbane, Australia, 29 June - 3 July 2003.

32. "Refined regulatory models and network inference via high level data integration", *Bat Sheva Interdisciplinary Workshop on Global Information in Biological Systems: The Emergence of Functional Organization*, Dead Sea, Israel, 19-21 October 2003.

33. "Computational dissection of regulatory networks using gene expression and other high throughput data", *ESF exploratory workshop on Genomic Approaches to DNA microarray data analysis*, National Center for

Oncology Research (CNIO), Madrid, Spain, 30-31 October, 2003.

34. "Bioinformatics in Israel", *the First Viterbi Computational Biology Conference*, University of Southern California, 15 December 2003.

35. "Inference in genetic networks", *the First Viterbi Computational Biology Conference.* University of Southern California, 16 December 2003.

36. "Reverse engineering of genetic networks", *Merck distinguished seminar series*, Carnegie Mellon University, Pittsburgh, PA, 19 February 2004.

37. "Maximum likelihood resolution of multi-block genotypes", *The second RECOMB Satellite Workshop on Computational Methods for SNPs and Haplotypes*, Carnegie Mellon University, Pittsburgh, PA, 21 February 2004.

38. "Revealing selection patterns in the evolution of yeast transcription regulation", *The first RECOMB satellite meeting on regulatory genomics*, University of California, San Diego, March 26-27, 2004

39. "Computational dissection of regulatory networks using diverse high-throughput data". **Keynote speaker**, *Computational Systems Bioinformatics conference* (CSB2004) Stanford, California, August 16-19 2004.

40. "Revealing the structure and dynamics of cis-regulation using heterogeneous, genome-wide, multi-species data". **Keynote speaker**, *15th International Conference on Genome Informatics*, Yokohama, Japan, December 13-15 2004.

41. "A computational approach to the understanding of transcription factor regulation". *Annual meeting of the Israel Endcorine Society*, Tel Aviv, December 21, 2004.

42. "Tracing the evolution of regulatory signals in DNA", Stringology research workshop of the Israeli Science Foundation, Haifa University, April 4–8, 2005.

43. "Modeling, inference and evolution in bionetworks". Invited speaker, *International Workshop on Complex Biomolecular Networks: Structure, Evolution, and Function*, Montauk Yacht Club, Long Island, New York, September 6-9, 2005.

44. "Modularity, evolution and regulation in bionetworks". Invited speaker, *The German Society for Biochemistry and Molecular Biology* (GBM), Berlin, Germany, September 18–21, 2005.

45. "SHARP - A platform for recording, visualizing and analyzing signaling pathways". Invited talk, *International Symposium on Signal Transduction in Health and Disease* (STADY IV) Tel Aviv, Israel, October 26-28, 2005.

46. "Computational tools for analysis of microarray data", *Wellcome Trust course Functional Genomics and Systems Biology*, Hinxton, UK, 21–22 June 2006.

47. "Computational methods for refinement and expansion of signaling pathways". Invited speaker, *Workshop on Bioalgorithmics*, Institute for Mathematical Sciences, National University of Singapore, Singapore, 14 July 2006.

48. "On the evolution of transcription regulation networks". Invited speaker, *The Third Annual RECOMB Satellite Workshop on Regulatory Genomics*, Singapore, July 17-18 2006.

49. "Some computational challenges in today's bio-medicine". **Keynote speaker**, *European Symposium on Algorithms* (ESA). Zurich, Switzerland, September 11-14 2006.

50. "Representation and expansion of regulatory pathways". Invited speaker, *Genomics and Cancer: Integrating Genomics with Clinical Research and Therapy*, Heidelberg, Germany September 14 2006.

51. "Some current computational challenges in biology and medicine". Invited speaker, *CASB meeting on Algorithmic Biology*, UC San Diego, November 30 2006.

52. "Modeling and expansion of signaling pathways". Keynote speaker, *RECOMB satellite meeting on Systems Biology*, San Diego, December 1 2006.

53. "Models, modules and modes in biological networks". **Keynote speaker**, *2nd DREAM conference (Dialogue on Reverse Engineering Assessment and Methods)*, New York Academy of Science, New York, December 3–4 2007.

54. "Computational studies of rearrangements and dysregulated pathways in cancer". Invited speaker, *Conference on Cancer Genome and EpiGenome: new technologies and new challenges.* Institut Mutualiste Montsouris, Paris, 13-14 Dec 2007.

55. "Modeling and improving models of biological networks". Invited speaker, *meeting on Mathematics of Biological Networks*, Institute Henri Poincare', Paris, December 17–18 2007.

56. "Transcriptional regulatory elements: their evolution, selection and detection". Invited speaker, *The Fifth Congress of the Federation of the Israel Societies for Experimental Biology*, (Ilanit), Eilat, Israel, 28–31 January 2008.

57. "Computational analysis in cancer and Huntington disease: genome rearrangements and dysregulated pathways". Invited speaker, *Clinical Systems Biology Symposium*, Weizmann Institute, March 23–24 2008.

58. "Analysis of regulatory microRNAs using sequence and interaction networks". Invited speaker, *European Science Foundation workshop on Non-coding RNAs: Computational Challenges and Applications*, Antalia, Turkey, April 28–30, 2008.

59. "Computational challenges in understanding gene regulatory networks". **MacKay Lecture**, Electrical Engineering and Computer Science Colloquium, UC Berkeley, October 1, 2008.

60. "Integrated analysis of biomedical data: from connectivity to cancer", UC Davis Distinguished Lecturer Series, Department of Computer Science UC Davis, October 16, 2008.

61. "Dissecting biological networks", *Plant Systems Biology Meeting*, Ghent University, Belgium, December 18-19th 2008.

62. "Transcriptional regulatory elements: their evolution, selection and detection", *CASB-20 meeting*, San Diego, CA, March 13-14 2009.

63. "Integrated analysis of biomedical data: the power of connectivity". Invited speaker, *Cold Spring Harbor meeting on Systems Biology: Networks.* Cold Spring Harbor, NY, March 18-22, 2009.

64. "Computational tools for dissecting biological networks", *US-EU Workshop on Systems Level understanding of DNA damage Responses*, Egmond aan Zee, the Netherlands, March 30 2009.

65. "Matrices, modules and motifs for understanding gene regulation". Invited speaker, *Israeli Statistical Society meeting*, Ben Gurion University, Beer Sheva, 17 June 2009.

66. "Do networks help in microarray data analysis?" *2nd CASB-20 meeting*, San Diego, CA, May 21-22, 2010.

67. "From DNA chips to cancer treatment", *2nd RECOMB satellite workshop on Bioinformatics Education*, San Diego, CA, May 22-23, 2010.

68. "Computational tools for dissecting complex disease". Invited speaker, *Cold Spring Harbor Asia meeting on Computational Biology*, Suzhou, China, 27 October - 1 November, 2010.

69. "Dissecting regulatory networks and complex disease". Invited talk, 11th Haifa Workshop on Interdisciplinary Applications of Graph Theory, Combinatorics, and Algorithms Haifa, Israel, May 17-19, 2011

70. "Computational Analysis of Gene Regulation, Disease Classification and Protein Networks". Invited talk, Clinical Genomics workshop, IBM Haifa, June 2 2011.

71. "Graph-theoretic methods in genomics and disease". Invited talk, Conference "Informatics and Mathematical Sciences: interaction with biomedical sciences" Paris-6 University, Paris, June 17 2011.

72. "Algorithmic methods for analyzing regulatory networks and complex disease". Invited talk, Boehringer Ingelheim Fonds 104th International Titisee Conference on Genomic Regulation, Titisse, Germany Oct 12-16 2011.

73. "Large-scale analysis of chromosomal aberrations in cancer karyotypes: towards understanding the role of aneuploidy", Workshop on Cancer Genomics, Institute of Pure and Applied Mathematics, University of California, Los Angeles, USA Oct.31 - Nov 1, 2011.

74. "Gene regulation, protein interaction and disease - a computational perspective". Invited speaker, X CRG Annual Symposium "Computational Biology of Molecular Sequences", Barcelona, 10-11 Nov 2011.

75. "Some Computational Challenges in Cancer Genomics". **Keynote speaker**, Symposium on 30 Years of

Computational Biology at USC, University of Southern California, March 30- April 1 2012:.

76. "Transcriptomics: Does it contribute to our understanding of Parkinson's disease?". Invited speaker, The MDS 16th International Congress of Parkinson's Disease and Movement Disorders Dublin, Ireland, June 17-21, 2012.

77. "Gene regulation, protein networks and disease - a computational perspective". **Keynote speaker**, 23rd Annual Symposium on Combinatorial Pattern Matching Helsinki, Finland, July 3-5, 2012.

78. "Dissecting inner structure in disease regulatory networks using differential co-expression". Invited speaker, RECOMB Satellite Conference on Open Problems in Algorithmic Biology (RECOMB-AB), St. Petersburg, Russia, August 27-29 2011.

79. "Dissecting inner structure in disease regulatory networks using differential co-expression". From Phenotypes to Pathways 2012, Inferring genetic architecture from perturbation maps, Lucy Cavendish College, Cambridge, UK, Aug 30 - Sept 01, 2012.

80. "The little Dutch boy and the Genomics tsunami". Invited talk, 15th Israeli Bioinformatics Symposium. Ben Gurion University of the Negev, June 27 2013.

81. "Revealing Structure in Disease Regulation and Networks". Short course. International Summer School on Trends in Computing (SSTiC 2013) Tarragona, Spain 22-26 July 2013.

82. "David Sankoff and other rearrangements". Invited talk, Conference on Models and Algorithms for Genome Evolution, Montreal, Canada, August 23–26, 2013.

83. "Chromosome organization and gene function in normal and tumor cells". Invited talk, Computational Cancer Genomics meeting, Bertinoro, Italy September 8–13 2013

84. "Chromosome organization and gene function in normal and tumor cells". Invited talk, 7th Congress of the Federation of the Israel Societies for Experimental Biology, Eilat, February 10-13, 2013.

85. "Bioinformatic Methods of Functional Analysis". Invited talk, XDP Workshop, Luebeck, Germany, June 13-15, 2014

86. "Shortest double-stranded DNA sequences covering all k-mers". Invited talk, STRINGOLOGY 2015 the Dead Sea, Israel January 4 2015.

87. "Some Current Computational Challenges in Bioinformatics". Plenary talk, Annual meeting of the Israeli Mathematical Union, the Dead Sea, Israel May 29 2015.

88. "Supple algorithms and data integration for understanding diseases". **Keynote speaker**, [BC]2 Computational Biology Conference, 7-10 June 2015, Basel, Switzerland.

89. "Inference of binding site models from HT-Selex data". Invited talk, Workshop: "Beyond Position weight matrices - towards next generation tools for predicting protein-DNA interactions". 8 June 2015, Basel, Switzerland

90. "Do networks help in making sense of the omics data deluge?". Invited talk, Network Biology SIG meeting, ISMB July 10 2015, Dublin, Ireland.

91. "Supple algorithms and data integration for understanding diseases". **Keynote speaker**, Genomic Medicine conference, July 22, 2015, Ho Chi Minh City, Vietnam.

92. "Some Current Computational Challenges in Bioinformatics". Invited speaker, KarpFest 80: A special conference celebrating Dick Karp's 80th birthday, October 17 2015, Berkeley, CA, USA.

93. R. Shamir, D. Amar "Joint Analysis of Multiple Cancer Types for Revealing Disease-Specific Genomic Events". Workshop on Computational Cancer Biology, Simons Institute for Theoretical Computer Science, UC Berkeley February 1 2016, Berkeley, CA, USA.

94. R. Shamir, Y. Orenstein "Utilizing de Bruijn Graphs in Universal Sequence Design for Discovery of Regulatory Elements". Workshop on Reguatory Genomics and Epigenomics, Simons Institute for Theoretical Computer Science, UC Berkeley, March 10, 2016, Berkeley, CA, USA.

95. R. Shamir, D. Amar, A. Maron-Katz, D. Yekutieli, T. Hendler. "Module discovery in 3-way data". Workshop on Biological Networks, Simons Institute for Theoretical Computer Science, UC Berkeley, April 11-15,

2016, Berkeley, CA, USA.

96. R. Shamir. "Modularity and classification through the network lens". Invited speaker, QNetS Workshop: Whats new in networks? Building bridges between computational, mathematical and statistical network analysis Ludwig-Maximilian Universitaet Munich, October 5-7 2016.

Grants

1. 1994–1997 Israeli Ministry of Science, "Algorithms for Physical Mapping".
2. 1994–1996 Tel Aviv University Research Fund "Exploiting Special Structure in Linear Programming Problems".
3. 1996–1997 Israeli Academy of Science, "Computational Aspects of the Human Genome Project".
4. 1997–2001 The German - Israeli Fund (G.I.F.), "ALLIGATOR: Algorithmic and Laboratory Large-scale Integrated Genome Analysis with The Olfactory Receptor Sub-Genome as a Model", with H. Lehrach (Max Planck Inst, Berlin) and D. Lancet (Weizmann).
5. 1997–2000 Israeli Ministry of Science, "Novel Computational Methods for Genome Analysis" (Infrastructure grant).
6. 1999–2002 Israel Science Foundation, "Graph Modification Problems and their Applications to Genome Research".
7. 2000 Agilent Technologies, "Modeling Cellular Networks from Gene Expression Data".
8. 2000-2001 Tel Aviv University Research Fund, "Computational Methods for Inferring and Verifying Regulatory Pathways using DNA Chips".
9. 2000–2003 US-Israel Binational Science Foundation, "Computational Improvements in DNA Sequencing and Analysis", with R. M. Karp (U.C. Berkeley).
10. 2001–2003 Israel Ministry of Science Strategic - Infrastructure grant, "A Comprehensive Strategy Combining Biological Analysis, Microarray Technology and Algorithm Development, for the Dissection of Cellular Responses to Environmental DNA Damaging Agents", with Y. Shiloh, A. Barzilai (TAU Med. School), N. Kaminski and G. Rechavi (Sheba Medical Center).
11. 2001-2002 the McDonnell Foundation, "A Computational Framework for Studying Complex Biological Networks", pilot grant.
12. 2002-2003 Tel Aviv University Research Fund, "A Computational Platform for DNA Resequencing",
13. 2002-2006 Israel Science Foundation, "Graph Theoretic Techniques and Their Application to Computational Genomics"
14. 2002-2004 Ataxia Telangiectasia Children Project, "Establishment of SHARP - a bioinformatic tool for the integration and presentation of ATM-related knowledge", with Y. Shiloh (TAU Med. School).
15. 2003– The Raymond and Beverly Sackler Chair in Bioinformatics, Tel Aviv University.
16. 2004-2006 European Union Sixth Framework Programme project, "EMI-CD: European Modeling Initiative Combating Complex Diseases", with H, Lehrach (Max Planck Inst., Berlin), Imre Vastrik (EMBL-EBI), Thure Etzold (LION), Arif Malik (MicroDiscovery).
17. 2005-2007 Wolfson Foundation, "Combining Functional Genomics and Bioinformatics with Cell Biology and Biophysics to Unravel the Molecular Complexity in Neurological Disorders and Cancer", with Yoel Kloog, Bernard Attali, Tal Pupko, Gideon Rechavi, Joab Chapman, and Avi Orr-Urtreger (TAU).
18. 2006–2007 German - Israeli Foundation (G.I.F.), "Haplotyping and Association Algorithms and Their Applications to Model Disease Genes" with Margret Hoehe (Max Planck Inst., Berlin).
19. 2006-2007 Coordinated Action under the EU Sixth Framework call for Life sciences, genomics and biotechnology for health. "ESBIC-D: European Systems Biology Initiative for Combating Complex Diseases", with H. Lehrach (MPI Berlin), A. Poustka (DKFZ Heidelberg), J.-P. Vert (Armines, France), C. Miller (PICR, UK), E. Barillot (Inst. Curie, Paris), K. Zatloukal (MEDUG, Austria).

20. 2006-2009 Israel Science Foundation, "Comparative Analysis of Protein Interaction Networks", CI, joint with R. Sharan (TAU).

21. 2007-2009 EU Sixth Framework, Specific Targeted Research Project (STREP), "GENEPARK: GENomic Biomarkers for PARKinson's disease" with B. Peterlin (University Medical Center Ljubljana Slovenia), A. Brice (INSERM, Paris France), C. Klein (University of Luebeck Germany), D. Krainc (Mediterranean Institute for Life Sciences Split Croatia), G. Ochoa (Progenika Biopharma, Derio Spain), O. Riess (Univ. Tuebingen Germany)

22. 2007-2008 French-Israel Research Network Program in Bioinformatics: "Analysis and Representation of Cancer-Related Signaling Networks" with E. Barillot (Curie Inst., Paris).

23. 2007-2010 Israel Science Foundation, converging technologies program. "Systems-Level Delineation of Signalling Networks Modulating the DNA Damage Response". PI, joint with Y. Shiloh (TAU).

24. 2008-2012 EU Seventh Framework large-scale integrated project, "APO-SYS: Apoptosis Systems Biology Applied to Cancer and AIDS. An Integrated Approach of Experimental Biology, Data Mining, Mathematical Modelling, Biostatistics, Systems Engineering and Molecular Medicine", one of 23 PIs.

25. 2008-2012 Israel Science Foundation, "Algorithms and Platform for Analysis of Large Scale Post-Genomic Data".

26. 2009-2012 EU Seventh Framework cooperation project, "TRIREME: Systems-Level, Multi-layer Understanding of Cellular Responses to Ionizing Radiation", with Y. Shiloh, R. Abersold, H. Lehrach, A. Venkitaraman, J. Bartek.

27. 2009-2012 The Wolfson Family Charitable Trust, "MicroRNA analysis consortium", PIs: G. Ast, K. B. Avraham, S. Efrat, R. Navon, H. Werner, N. Shomron, A. Avni, O. Elroy-Stein, Y. Gothilf, T. Pupko, R. Shamir E. Eisenberg, S. Izraeli, G. Rechavi, Y. Sidi, M. Lahav.

28. 2010-2011 IBM Reserach Open Collaborative Research (OCR) research grant, "Clinical Genomic Analysis", PIs: E. Halperin, S. Rosset, R. Shamir, in collaboration with IBM Haifa Research Lab Machine Learning group.

29. 2010-2011 Intel Corporation. "Post-Silicon Optimization Using Machine Learning Techniques".

30. 2011-12. The Wolfson Family Charitable Trust. "Functional Genomics Center for Personalized Translational Medicine of Complex Diseases" PIs: N. Shomron, K. Avraham, Y. Shiloh, E. Ruppin, M. Weil, S. Rosset, R. Sharan, E. Eisenberg, S. Izraeli, G. Rechavi, Z. Ram, A. Orr, E. Halperin, Y. Elkabetz, S. Ben Shahar, I. Nachman, D Pe'er, A. Munitz, I. Gat-Viks, C. Levy, N. Erez, E. Perelson, I. Pesach, I. Ulitsky, R. Elkon, A. Erez, T. Geiger.

31. 2011-12. Scripps-Israel biomedical collaboration grant. Lee Perlstein Kagan Charitable Trust, Miami, Florida.

32. 2012-17 Israeli Center for Research Excellence (I-CORE) Gene Regulation for Complex Human Diseases. 30 Research groups from three universities and two hospitals.

33. 2012-13 "Understanding Genetic Susceptibility to Fungal Infection using Naive Collaborative Cross Mice". ESGI Transnational access project (funding for large scale sequencing). PIs: F Iraqui, R. Shamir, I. Gat-Viks, R. Mott.

34. 2012-14 Israel Cancer Research Fund project grant "Computing Cancer Biomarkers by Joint Analysis of Expression Profiles and Protein Networks".

35. 2013-16 Israel Science Foundation. "Computational Dissection of Structural and Numerical Aberrations in Cancer Karyotypes".

36. 2014-19 Yad Hanadiv. "Edmond J. Safra Centre for Bioinformatics at Tel Aviv University".

37. 2014-15 Dotan Center in Hemato-Oncology, IDEA grant. "Computational Drug Repositioning and Biomarker Discovery in Hematological Cancers". CI: Shai Izraeli.

38. 2015-18 Israel Science Foundation and Chinese Academy of Science binational China-Israel grant. "Algorithmic Methods for Metagenomic Data Analysis". With Ting Chen (Tsinghua University).

Professional Memberships

- 1984- The Association of Computing Machinery (ACM)
- 1984- ACM Special interest group on Algorithms and Computation Theory (SIGACT)
- 1984-1997 The Institute for Operations Research and Management Science (INFORMS, formerly the Operations Research Society of America - ORSA)
- 1985-1995 The Operations Research Society of Israel (ORSIS)
- 1987- The European Association for Theoretical Computer Science (EATCS)
- 1993- The Human Genome Organization (HUGO)
- 1996-2014 The American Associations for the Advancement of Science (AAAS)
- 1999- The International Society for Computational Biology (ISCB)
- 2002- The Israeli Society for Bioinformatics and Computational Biology (ISBCB)
- 2010 - European Research Institute for Integrated Cellular Pathology (ERI-ICP),
- 2010 - Israeli Society of Cancer Research
- 2010 - European Association of Cancer Research elected member.

Reviewing Activities

ACM-SIAM Symposium on Discrete Mathematics (SODA)
Advances in Applied Mathematics
Advances in Bioinformatics
Algoritnms in Molecular Biology
American Journal on Human Genetics
Annals of Mathematics and Artificial Intelligence
Bar-Nir Bergreen Software Technology Center of Excellence, the Technion
Bioinformatics
BMC Bioinformatics
BMC Evolutionary Biology
BMC Genomics
Briefings in Functional Genomics
Canadian Genome Analysis and Technology (CGAT) Program
Caesarea-Rothschild Institute for Interdisciplinary Applications of Computer Science
Combinatorial Pattern Matching (CPM)
Cell
Discrete Applied Mathematics
Discrete Mathematics
European Symposium on Algorithms (ESA)
FEBS Letters
Genome Biology
Genome Research
Human Heredity
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Computers
German Israel Fund (GIF)
Indian National Science Academy
Information Processing Letters
International Conference on Intelligent Systems for Molecular Biology (ISMB)
International Symposium on Automata, Languages and Programming (ICALP)

International Symposium on Computational Molecular Biology (RECOMB)

Israel Academy of Sciences

Israel Ministry of Sciences and Technology

Israeli Symposium on the Theory of Computing and Systems (ISTCS)

Journal of Algorithms

Journal of Computational Biology

Linear Algebra and Its Applications

Mary Ann Liebert, Inc., Publisher

Mammalian Genome

Mathematics of Operations Research

Metabolic Engineering

National Science and Engineering Research Council of Canada

Nature Biotechnology

Nature Genetics

Nature Protocols

Nature Reviews Genetics

The Netherlands Organisation for Scientific Research (NWO)

Networks

Neural Processing Letters

Nucleic Acids Research

Pacific Symposium on Biocomputing (PSB)

PLoS Computational Biology

PLoS One

Prinses Beatrix Fonds, the Netherlands

Proteomics

PWS Publishing Company

Research Grants Council of Hong Kong

Royal Society of New Zealand Marsden Fund

Science

Science Signaling

SIAM Journal on Computing

SIAM Journal on Discrete Mathematics

Swedish Research Council for Engineering Sciences

Symposium on the Theory of Computing (STOC)

Transactions in NanoBiosciences

US-Israel Binational Science Foundation (BSF)

Workshop on Algorithms in Bioinformatics (WABI)

Wellcome Trust

Students Supervised

A. Master Students

1988–1989 Haim Kaplan, "A Primal-Dual Path Following Algorithm for Linear Programming with Box-Type Constraints".

1989–1990 Yaron Pinto, "Efficient Algorithms for the Minimum Cost Flow Problem with Multiple Arcs".

1994–1995 Yitshak Pe'er, "Interval Graphs with Metric Constraints".

1994–1996 Shay Litvak, "Efficient Algorithms for Constructing and Employing Variable-length Markov Models for Language".

1996-1998 Guy Mayraz, "Algorithms for Physical Mapping with Non-Unique Probes".

1994-1998 Erez Hartuv, "Graph Algorithms for DNA Physical Mapping with Noisy Data".

1998-1999 Assaf Natanzon, "Complexity and Approximation of Some Graph Modification Problems".

1998-2000 Dmitri Shmulevich, "Analysis of Oligonucleotide Array Data: Clone Preselection and Hybridization Models".

2000-2002 Amos Tanay, "Algorithmic Expansion Of Gene Networks".

2000-2002 Nir Orlev, "Development of a Bioinformatic Tool for Interactive Study of Protein-Protein Interactions".

2001-2003 Chaim Linhart, "The Degenerate Primer Design Problem".

2001-2002 Adi Akavia, "Designing Multi-Route Synthesis in Combinatorial Chemistry - Complexity and Algorithms".

2001-2004 Michal Ozery, "A Correction to the Theory of Sorting Genomes by Reversals and Translocations".

2002-2004 Tamar Barzuza, "Computational Resolution and Tagging of Perfect Phylogeny Haplotypes".

2002-2004 Adi Maron-Katz , "Tools for Analysis and Visualization of Gene Expression Data Obtained Using Microarrays".

2003-2004 Noga Amit, "The Bicluster Graph Editing Problem".

2003-2004 Reut Shalgi, "Discovery of Functional Sequence Motifs and their Combinations Through Gene Annotations".

2004–2007 Seagull Shavit, "Genome-Wide Dissection of Cellular Responses to DNA Double-Strand Breaks Using Integrated Analysis of Expression Microarrays and Bioinformatics".

2005–2007 Israel Steinfeld, "Biclustering and Functional Modules in Yeast".

2005–2007 Daniela Raijman, "A Probabilistic Model for the Evolution of Promoters".

2006–2007 Ofir Davidovich, "Computational Problems in Human Genetics".

2006–2008 Yonit Halperin, "Discovery of Motifs Involved in Transcriptional Regulation".

2006–2008 Michael Gutkin, "Feature Selection Methods for Classification of Gene Expression Profiles".

2007–2009 Sharon Bruckner, "Topology-Free Querying of Protein Interaction Networks".

2007–2010 Ofer Lavi, "Classification of Cancer Expression Profiles Using Network Data".

2010–2012 David Amar, "Using Differential Co-expression for Dissecting Biological Processes and Revealing Disease Specific Gene Regulation".

2010–2013 Ron Zeira, "Post-Silicon Test Optimization Using Methods from Bioinformatics".

2012–2016 Rami Eitan, "Reconstructing cancer karyotypes from paired-end reads and copy number data".

2014– Idan Nurick

2015– Tom Hait

2015 – Maor Dan

B. Doctoral Students

1995–2002 Dekel Tsur, "Algorithmic Problems in Graph Theory and Molecular Biology".

1996—2002 Itsik Pe'er, "Algorithmic Methods for Reconstruction of Biological Sequences, Gene Orders and Maps". -

1996–2002 Roded Sharan, "Graph Modification Problems and their Applications to Computational Biology".

2000–2004 Tzvi Hartman, "Problems in Computational Genomics and DNA Chips".

2002–2005 Amos Tanay, "Modeling and Inference of Molecular Networks".

2001–2006 Rani Elkon, "Development of Bioinformatics Methods for Analysis of Functional Genomics Data and Their Application to the Study of DNA Damage Response".

2002—2006 Gad Kimmel, "Computational problems in modern human genetics".

2003–2006 Rotem Sorek, "Using computational tools to identify sequences that regulate alternative splicing".

2002–2007 Irit Gat-Viks, "Computational Analysis Of Molecular Networks: Modeling And Reconstruction".

2004–2009 Chaim Linhart, "Discovering Motifs in Large Genomic Databases".

2004–2009 Michal Ozery-Flato, "Computational Problems in Genome Rearrangements: from Evolution to Cancer".

2005–2009 Igor Ulitsky, "Network-Based Algorithms for Analysis of Heterogeneous Biomedical Data".

2008–2012 Guy Karlebach, "Modeling and Analysis of Perturbations in Gene Regulatory Networks".

2010–2014 Yaron Orenstein, "Improving Our Understanding of Gene Regulation by Analyzing Data from New Technologies".

2010–2015 Adi Maron-Katz, "Unsupervised characterization of human brain networks that are involved in emotional processing and regulation".

2012-2015 David Amar , "Novel methods for integrative analysis of heterogeneous large scale biomedical data".

(current) Roye Rozov, "Algoriths for Anlysis of Deep Sequencing Data".

(current) Dvir Netanely, "Expression and Epigenetic Biomarkers for Breast Cancer Subtypes".

(current) Ron Zeira, "Combinatorial Analysis of Cancer Karyotype Evolution".

(current) Kobi Perl, "Joint Protein, RNA and MicroRNA analysis of Inner Ear Systems".

(current) David Pellow,"Algorithms for optical mapping and metagenomics".

C. Post-Doctoral Students

1994-1996 Dalit Naor, " Computational Aspects of the Human Genome Project"

2000-2002 Shay Halperin, "Comparative and Functional Genomics"

2005–2007 Michal Ziv-Ukelson, "Modelling and Identifying RNA Sequence and Structure Regulation Signals"

2006–2007 Rani Elkon, "Computational Analysis of DNA Damage Response Pathways"

2007–2008 Irit Gat-Viks, "Molecular Networks: Modeling and Analysis"

2007–2008 Firas Swidan, "Genome Rearrangements"

2007–2008 Panos Giannopoulos, "Protein Network Representation"

2008–2009 Falk Hueffner, "Graph Theoretic Methods in Bioinformatics"

2008–2011 Arnon Paz, "DNA Damage and Apoptosis Pathway Curation and Analysis"

2009–2010 Mukul Bansal, "Graph Algorithms for Biological Networks and Trees"

2009–2010 Gal-Hagit Romano, "Yeast Genetics"

2010–2012 Annelyse Thevenin, "Cancer Aberrations"

2015-2016 Meirav Zehavi, "copy number evolution problems"

2016 David Amar, "Integrated cancer analysis"

Courses Taught

- Algorithms
- Advanced Topics in Graph Algorithms
- Advanced Course in Linear Programming
- Algorithms in Molecular Biology
- Analysis of Gene Expression Data and Gene Networks
- Computational Complexity
- Linear Algebra
- Computational Genomics
- Seminars in Computational Analysis of Gene Expression data, The Mathematics of DNA Microarrays, Motif Finding, Genetic Network Analysis, Big Data Analysis in Biology and Medicine, Network Flow Algorithms, Algorithms for Analysis of Genome Variation and Disease.

Major Committee Activities

- *Simons Institute for Theoretical Computer Science, UC Berkeley*,
  Chair, Algorithmic Challenges in Genomics, a semester-long program, Spring 2016.
- *Dan David Foundation*, member of committee of future dimension prize in Bioinformatics, 2015
- International Conference on Computational Molecular Biology (RECOMB) **steering committee member**, 1995-2008.
- The Israeli Society for Bioinformatics and Computational Biology (ISBCB) - **Founding member**; board member 2002- ; **president**, 2004-2006.
- Advisory Council Member, the Centrum voor Wiskunde en Informatica (CWI), Amsterdam, 2008–
- Israel National Center for Personalized Medicine (INCPM) - steering committee and managing steering sub-committee member, 2012-
- Scientific Advisory Board member, Swiss Institute of Bioinformatics, 2009–
- Scientific Advisory Board member, Simons Institute for the Theory of Computing, 2012–2013
- Chair, expert evaluation committee for INRIA Theme "Computational Biology and Bioinformatics", 2009.
- International Federation for Information Processing (IFIP) - Special interest group on Bioinformatics, member of the core committee, 2009 –
- Member, Committee for Higher Education subcommittee for evaluating the academization of Israeli Airforce Fight Academy ('Kurs Tais'), 2003–
- Scientific advisory board member for external review of the plan to initiate an Institute for Medical Genomics and Systems Biology, Vienna, 2004-2005.
- Israeli Science Foundation, grant review panel member, 2003, 2004, 2010, 2011.
- Member, subcommittee of the Israel Council for Higher Education on setting up a new college M.Sc. program, 2001–2003.
- *IEEE Transactions on Bioinformatics*, member, advisory board for setting up the journal, 2003
- US- Israel Binational Science Foundation, grant review panel member, 2002
- **Head**, Tel Aviv University committee for the development of an interdisciplinary undergraduate degree in Bioinformatics, 1999–2000.
- Israeli Academy of Sciences and Humanities, Review Committee for the National Bioinformatics Center, member, 1994–1997.
- International Federation for Information Processing, working group on Discrete Optimization (WG7.4), member, 1997–2002.
- Israeli Ministry of Science and Technology, Oversight committee for the National Center for Bioinformatic-Genetic Infrastructure, member, 1996–2001.