

CURRICULUM VITAE

Michael Elad

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PERSONAL DATA

Date of Birth: December 10th, 1963

Place of Birth: Haifa, Israel

Cellular Phone: +972-54-6569807.

ACADEMIC DEGREES

1994–1997: D.Sc. in Electrical Engineering – The Technion – Haifa - Israel.

Graduated on September 1997. Final average - 96.6.

Specialization on: Signal and Image Processing, Computer Vision, Adaptive filters.

Thesis: Super resolution Reconstruction of Continuous Image Sequences.

Supervisor: Prof. Arie Feuer.

1986–1988: M.Sc. in Electrical Engineering – The Technion – Haifa - Israel.

Graduated on February 1988. Final average - 95.0.

Specialization on: Signal and Image Processing, Communication.

Thesis: Digital Coding of Image Sequences with Motion Compensation.

Supervisor: Prof. David Malah.

1982–1986: B.Sc. in Electrical Engineering–The Technion–Haifa–Israel.

Graduated on February 1986. Final average - 91.6.

Specialization on: Communication, Control, Networks and Computers.

ACADEMIC APPOINTMENTS

2010 (July) – present: The Computer Science Department – The Technion, Haifa 32000, Israel.

Work: Professor.

2007 – 2010: (Started on June 2007, and till June 2010) – The Computer Science Department – The Technion, Haifa 32000, Israel.

Work: Associate Professor.

2003 – 2007: (Started on October 2003, and till May 2007) – The Computer Science Department – The Technion, Haifa 32000, Israel.

Work: Senior Lecturer (tenure-track position). Teaching and performing research in the fields of signal and image processing and computer vision, with emphasis on signal representation and numerical algorithms.

2001 – 2003: (Started on October 2001, and till September 2003) Stanford University.

Work: Research Associate with the Computer Science department, and affiliated to the Scientific-Computing & Computational Mathematic (SCCM) program, led by Prof. Gene Golub. My work concentrated on three projects, all in the area of inverse problems:

1. Collaborating with Prof. Gene Golub (CS - Stanford) and Prof. Peyman Milanfar (UCSC), working on the reconstruction of 2D shapes from their complex moments.
2. Collaborating with Prof. David Donoho (Statistics – Stanford), working on inverse problems in target detection/recognition, fast polar Fourier transform, and sparse representations.
3. Collaborating with Prof. Peyman Milanfar (UCSC) and his students, working on super-resolution reconstruction of images.

PROFESSIONAL EXPERIENCE

2000 – 2001: (Started on February 2000, and till September 2001) Jigami, Israel.

Work: Heading the research division in the company - Working in the fields of data compression in general, and specializing on image and video processing and coding.

1997 – 2000: (Started on January 1997, and till January 2000) HP-Laboratories, Israel.

Work: Research and Development in the fields of image processing, computer vision and pattern recognition.

Research projects include super-resolution reconstruction of images, fast face detection in images, optical flow estimation, documents classification, accurate (sub-pixel) edge detection, illumination estimation-variational approach, image restoration and demosaicing, and content based search-multimedia databases.

1993 – 1993: (6 months) Advanced Technologies Limited (ATL)–Atidim, Tel-Aviv.

Work: Defining a system in the fields of Geographical Information Systems (GIS) and Photogrammetry.

1988 – 1993: Army service – Israeli Air Force.

Work: Project Officer, responsible to define and establish a large system in the fields of Photogrammetry, image processing, and digital archives.

RESEARCH INTERESTS

- **Inverse problems in signal and image processing and computer vision**
- **Sparse modeling of signals and their deployment in signal and image processing**
- **Numerical analysis - optimization theory, Numerical Linear Algebra**
- **Machine learning algorithms**

TEACHING EXPERIENCE

2017 – present: Created a specialized Massive Open Online Course (MOOC) on sparse representation theory, given under edX.

2003 – present: Lecturing the courses “Digital Image Processing” (236860) “Digital Signal and Image Processing by Computer” (236327), “Mathematical Methods for Computer Science” (234299), “Introduction to Computer Science” (234114/7), “Numerical Analysis 1” (234107), and “Sparse and redundant representations and applications in signal and image processing” (236862).

2011 – 2014: Supervising the course “Industrial projects” (234313) – the CS Department in the Technion.

1999 – 2001: Lecturing the course “Introduction to Digital Image Processing” – the EE Department in the Technion.

1997 – 1998: Lecturing the course “Numerical Methods in Optimization” (046197) – the EE Department in the Technion.

1995 – 1996: Teaching the course “Introduction to Digital Signal Processing, as a teaching assistant of Prof. Boaz Porat – the EE Department in the Technion.

1993 – 1995: Instructing in laboratories, and supervising under-graduate students final projects – the EE Department in the Technion.

1985 – 1988: Instructing in laboratories, and supervising under-graduate students final projects – the EE Department in the Technion.

PUBLIC PROFESSIONAL ACTIVITIES

Editorial Boards:

2016 (January) – Present: Editor-in-Chief, SIAM Journal on Imaging Sciences.

2010 – 2015: Associate Editor, SIAM Journal on Imaging Sciences.

2012 – 2015: Associate Editor, Journal on Applied Computational Harmonic Analysis.

2012 – 2014: Senior Associate Editor, IEEE Signal Processing Letters.

2011 – 2014: Associate Editor, IEEE Transactions on Information Theory.

2007 – 2011: Associate Editor, IEEE Transactions on Image Processing.

2006 – 2007: Associate Editor, EURASIP Journal on Applied Signal Processing.

Invited Editor, Journal on Fourier Analysis and Applications - Special Issue on Sparsity (with A. Cohen, R. DeVore, A. Gilbert), 2009.

Invited Editor, Proceedings of IEEE - Special Issue on Applications of Sparse Repres. & Compressed Sensing, (with R.G. Baraniuk, E.J. Candes, Y. Ma), 2010.

Invited Editor, IEEE Selected Topics in Signal Processing - Special Issue on Adaptive Sparse Representation (with J.L. Starck, J.Fadili, R.Nowak, P.Tsakalide), 2011.

Invited Editor, International Journal on Computer Vision - Special Issue on Sparsity (with J. Mairal and F. Bach), 2014.

Reviews for Journal publications:

1. IEEE Trans. On Image Processing
2. IEEE Trans. On Pattern Analysis and Machine Intelligence (PAMI)
3. IEEE Trans. On Information Theory
4. Applied and Computational Harmonic Analysis
5. Journal of the Optical Society of America (JOSA)
6. EURASIP Journal on Applied Signal Processing
7. SIAM Review
8. International Journal of Computer Vision
9. Signal Processing: Image communication
10. SIAM Matrix Analysis
11. SIAM Imaging Science
12. ISF, NSF, ERC and BSF proposals.

Program Committees:

Special session organizer at SIAM Conference on Imaging Science, Mini-Symposium Organizer, 2018.

Special session organizer at SIAM Conference on Imaging Science (IS16), Albuquerque, New Mexico, USA May 23-26, 2016.

Special session organizer at SIAM Conference on Imaging Science (IS14), Hong-Kong, May 12-14, 2014.

Special session organizer at SIAM Conference on Imaging Science (IS12), Philadelphia, USA, May 19-23, 2012.

Organizing (Program) Committee Member of SIAM Conference on Imaging Science (IS10), Chicago, Illinois, USA, April 12-14, 2010.

Co-organizer (jointly with Peyman Milanfar from UCSC) of special sessions on “Locally adaptive patch-based image and video restoration”, in the 2008 SIAM Imaging Science Conference, San-Diego, California, July 8, 2008.

Co-organizer (jointly with Jean-Luc Starck from CNRS-CEA, France) of special sessions on ”Topics in sparse and redundant representations”, in the 2008 SIAM Imaging Science Conference, San-Diego, California, July 8, 2008.

Technical Program Committee of IEEE Computer Society Conference on Computer Vision and Pattern Recognition, CVPR 2006, New York, USA, June 17-22, 2006.

Co-organizer (jointly with Emmanuel Candes from Caltech) of three special sessions on “Sparse Representations and Their Role in Image processing”, in the 2006 SIAM Imaging Science Conference, Minneapolis, Minnesota, May 15-17, 2006.

Technical Program Committee of International Conference on Image Processing, ICIP 2005, Genova, Italy, September 11-14, 2005.

Technical Program Committee of IEEE Computer Society International Conference on Computer Vision and Pattern Recognition, CVPR 2005, San Diego, USA, June 20-25, 2005.

Technical Program Committee of International Conference on Image Processing, ICIP 2004, Singapore, October 24-27, 2004.

Technical Program Committee International Conference on Acoustics, Speech, and Signal Processing, ICASSP 2004, Montreal, Quebec, Canada, May 17-21, 2004.

FACULTY AND TECHNION ADMINISTRATIVE JOBS

2015 – Present: Head of the Rothschild Technion Excellence Program.

2010 – 2015: Graduate Studies Committee member, Computer Science Dept., Technion.

2009 – 2015: Development Committee member, Computer Science Dept., Technion.

2009 – 2014: Vice Dean for Public Affairs - Alumni and Industry Relations, Computer Science Dept., Technion.

2007 – 2009: Coordinator for open days for undergraduates studies.

2005 – 2009: Computing Committee member, Computer Science Dept., Technion.

2004 – 2006: Graduate Studies Committee member, Computer Science Dept., Technion.

2003 – 2006: Council Secretary, Computer Science Dept., Technion.

AWARDS AND HONORS

- 2018 – SIAM Fellow
- 2017 – Awarded the Yanai Prize for excellence in teaching.
- 2017 – Thomson-Reuters Highly Cited Researcher: Michael Elad was selected (again) as a Thomson-Reuters Highly Cited Researcher.
- 2016 – Thomson-Reuters Highly Cited Researcher: Michael Elad was selected as a Thomson-Reuters Highly Cited Researcher.
- 2015 – Technion Henry Taub Prize for Academic Excellence.
- 2014 – SIAG/Imaging Science Best paper award. Jointly with Freddy Bruckstein (CS-Technion) and David L. Donoho (Stat.-Stanford).
- 2013 – Best lecturer award – The Technion – Israel Institute of Technology.
- 2012– IEEE Fellow: Elevated for contributions to sparsity-and-redundancy in image processing.
- 2010 – The Hershel-Rich Award for Innovation: A Technion award for the work on Super-Resolution (with Matan Protter).
- 2009 – Best lecturer award – The Technion – Israel Institute of Technology.
- 2008 – The Henry Taub Prize for Academic Excellence: A Technion award for research excellence.
- 2007 – The Solomon Simon Mani award for excellence in teaching (six awards were given) – The Technion – Israel Institute of Technology.
- 2006 – Best reviewer award (ten awards were given) - IEEE Trans. on Image processing journal.
- 2005 – Best lecturer award – The Technion – Israel Institute of Technology.
- 2004 – Best lecturer award – The Technion – Israel Institute of Technology.
- 2003 – Technion Management Career Development Chair – The Technion – Israel Institute of Technology.
- 2001 – Best lecturer award – The Technion – Israel Institute of Technology.
- 2000 – Best lecturer award – The Technion – Israel Institute of Technology.
- 1996 – Guthwirth - Special Excellence Scholarship – During the Ph.D. studies.
- 1987 – Wiener Excellence Award– During the M.Sc. studies.
- 1985 – ITT scholarship for excellence – During the undergraduate studies.

PLENARY OR INVITED TALKS

1. January 22nd, 2002. SCCM (Scientific Computing and Computation Mathematics Program) Seminar, Title: “Rejection Based Classifier for Face Detection”. Joint work with Yacov Hel-Or, Professor at the Interdisciplinary Center (IDC), Herzlia, Israel and Renato Keshet, Hewlett-Packard Laboratories, Israel.

2. March 18th, 2002. The Computer Vision Workshop - Stanford Computer Forum - Invited Talk, Title: "Rejection Based Classification and its Applications".
3. March 27th, 2002. SCCM - Linear Algebra Forum Seminar, Title: "Static and Dynamic Super-Resolution". Joint work with Arie Feuer, Professor at the Electrical Engineering Department, The Technion, Israel.
4. May 6th, 2002. SCCM (Scientific Computing and Computation Mathematics Program) Seminar, Title: "On the Bilateral Filter and Ways to Improve It".
5. July 12th, 2002. The SIAM 50th Anniversary Meeting - *Invited Talk*, Title: "Shape From Moments - An Estimation Perspective". Joint work with Peyman Milanfar, the Electrical Engineering department, University of California - Santa-Cruz, and Gene Golub, the Computer Science Department - Stanford University.
6. August 13th, 2002. FoCM - Image & Signal Proc. Workshop - *Invited Talk*, Title: "Fast Polar Fourier Transform". Joint work with David Donoho, Statistics - Stanford University, Amir Averbuch, Mathematics Department - Tel-Aviv University, and Ronald Coifman, Mathematics Department - Yale.
7. November 13th, 2002. IDR - Ideal Data Representation Workshop - University of South Carolina - *Invited Talk*, Title: "Sparse representations and the Basis Pursuit Algorithm. Joint work with Alfred M. Bruckstein, Computer Science department - Technion, Israel, David Donoho, Statistics- Stanford University, and Peyman Milanfar, the Electrical Engineering department, University of California - Santa-Cruz.
8. January 10th, 2004. AMS 10th meeting - special Session on Multiscale and Oscillatory Phenomena - *Invited Talk*, Title: "Image Decomposition Via the Combination of Sparse Representations and a Variational Approach", Joint work with Jean-Luc Starck from CEA, France, and David Donoho, Statistics- Stanford University.
9. September 25th, 2004. IPAM MGA Workshop - *Invited Talk*, Title: "Sparse Representations of Signals - Theory and Applications", Joint work with Jean-Luc Starck from CEA, France, David Donoho, Statistics - Stanford University, Alfred Bruckstein - CS, Technion, and V. Temlyakov, Math. - University of South Carolina.
10. January 27th, 2005. Industrial Affiliate Program, CS department, The Technion. *Invited Talk*, Title: "Recent Trends in Signal Representations and their Role in Image Processing". This talk has been also presented in the MVP seminar in Tel-Aviv University on May 25th, 2005.
11. August 2nd, 2005. SPIE meeting, San-Diego, CA. *Invited Talk*, Title: "The K-SVD: Design of Dictionaries for Sparse and Redundant Representation of Signals", Joint work with Michal Aharon and Alfred M. Bruckstein.
12. August 31st, 2005. Int. Conference on Super-Resolution, Hong-Kong - *Invited Talk*, Title: "Example-Based Priors for Inverse Problems in Image Processing", Joint work with Dima Dastenko - the Technion.
13. May 15th, 2006. SIAM Imaging Science conference, Minneapolis Minnesota, *Invited Talk*, Title: "An Iterated Shrinkage Algorithm for Basis Pursuit Minimization", Joint work with Michael Zibulevsky and Boaz Matalon - The Technion.

14. May 15th, 2006. SIAM Imaging Science conference, Minneapolis Minnesota, *Invited Talk*, Title: "Overcomplete and Sparse Representations for Image Decomposition and Inpainting", Joint work with Jean-Luc Starck from CEA, France, and David Donoho, Statistics- Stanford University.
15. July 11th, 2006. WavE 2006 - Wavelets and Applications conference, Lausanne, Switzerland, **Plenary Talk**, Title: "Sparse and Redundant Signal Representation, and its Role in Image Processing".
16. September 19th, 2006. Astronomical Data Analysis conference, 2006 (ADA IV), Marseille, France, *Invited Talk*, Title: Super-Resolution reconstruction of Images - an Overview". Joint work with Arie Feuer - The Technion, Peyman Milanfar and Sina Farisu - UC Santa Cruz, USA.
17. September 21st, 2006. Mathematics and Image Analysis conference (MIA'06), Paris, France, *Invited Talk*, Title: "Sparse and Redundant Signal Representation, and its Role in Image Processing".
18. December 17th, 2006. Israel Computer Vision Day, 2006. Interdisciplinary center, Herzlia. *Invited Talk*, Title: "Denoising and Beyond via Learned Dictionaries and Sparse Representations". Joint work with Michal Aharon and Matan Protter - the CS department, the Technion, Julien Mairal and Guillermo Sapiro, ECE department, University of Minnesota, Minneapolis, USA.
19. February 25th, 2007. Medical Imaging workshop - RAMBAM Hospital, Haifa. *Invited Talk*, Title: "New Results in Image Processing Based on Sparse & Redundant Representations".
20. June 20th, 2007. The IV workshop on SIP & IT, Holon Institute of Technology, Holon. *Invited Talk*, Title: "Optimized Projection Directions for Compressed Sensing". This talk was also given in MVP seminar in Tel-Aviv university on June 21st, and also in ICIAM, Zurich, on July 17th, 2007.
21. August 26th, 2007. SPIE, Wavelet XII, San-Diego, CA. **Plenary Talk**. Title: "A Wide-Angle View of Iterated Shrinkage Algorithms For Finding Sparse Representations". Joint work with Boaz Matalon, Michael Zibulevsky, and Joseph Shtok.
22. March 30th, 2008. ICASSP, Las-Vegas. Title: "A Sparse and Non-Negative Solution of $Ax=b$ is Necessarily Unique". Joint work with Michael Zibulevsky and Freddy Bruckstein.
23. June 26th, 2008. Tel-Aviv University, Approximation Seminar, the Mathematics department. Title: "Image Denoising and Beyond via Learned Dictionaries and Sparse Representations".
24. July 8th, 2008. SIAM Imaging Science 2008, San-Diego. Special Session on Locally Adaptive Patch-based Image and Video Restoration - Part II. Title: "Super-Resolution-Reconstruction of Image Sequences Without Explicit Motion Estimation". Joint work with Matan Protter (CS - Technion), Hiro Takeda and Peyman Milanfar (UCSC).
25. July 8th, 2008. SIAM Imaging Science 2008, San-Diego. Special Session on Topics in Sparse and Redundant Representations - Part I. Title: "A Weighted Average of Sparse Several Representations is Better than the Sparsest One Alone". Joint work with Irad Yavneh.
26. December 11th, 2008. **Plenary Talk**. Computational Algebraic Statistics, Theory and Applications (CASTA), Kyoto, Japan. Title: "Sparse and Redundant Representation Modeling for Image Processing". Joint work with Michal Aharon (CS - Technion, Guillermo Sapiro (UMN), Julien Mairal (Inria - France), and Matan Protter (CS - Technion).
27. April 6th, 2009. Statistics seminar, Ecole Polytechnique, France. Title: "MMSE Estimation for Sparse Representation Modeling". Joint work with Irad Yavneh and Matan Protter (CS - Technion).

28. March 2nd, 2010. *Invited Talk* for the High-Technion distinguished lecture series, the Technion, Haifa. Title: "Atomic Decomposition of Images - Advanced Topics in Image Processing".
29. April 14th, 2010. SIAM Imaging Science 2010 Conference, Chicago. Title: "Single Image Super-Resolution Using Sparse Representation", Joint work with Roman Zeyde and Matan Protter (CS - Technion).
30. June 9th, 2010. Workshop on Sparsity and Computation, Bonn Germany. Title: "Topics in Minimum-Mean-Squared-Error (MMSE) Estimation in Sparse Approximation", Joint work with Irad Yavneh, Javier Turek, and Matan Protter.
31. June 25th, 2010. **Plenary Talk** at the Curves and Surfaces conference, Grenoble, France. Title: "Sparse and redundant representation modeling of signals - theory and applications".
32. July 12-16 2010. **Short Course** at the Park City (Utah) Graduate Summer School, organized by the Institute of Advanced Studies (IAS), Princeton. Title: Sparse and Redundant Representation Modeling of Images.
33. August 15-20 2010. **Short Course** at graduate summer school on Sparsity in Image and Signal Analysis, Hólar, Iceland. Title: Sparse and Redundant Representation Modeling of Images.
34. January 7th, 2011. *Invited Talk* in the SMALL workshop on Sparse Dictionary Learning. Title: Exploiting Statistical Dependencies in Sparse Representations. Joint work with Tomer Peleg and Yonina Eldar (EE - Technion).
35. June 30th, 2011. SPARS11 - Workshop on signal processing with adaptive sparse structured representations, Edinburgh, Scotland, UK. Title: K-SVD Dictionary-Learning for Analysis Sparse Models. Joint work with Ron Rubinstein.
36. September 1st, 2011. EUSIPCO 2011, Special Session on Processing and recovery using analysis and synthesis sparse models, Barcelona, Spain. Title: Sequential Minimal Eigenvalues - An Approach to Analysis Dictionary Learning. Joint work with Mark Plumbley (QMUL - London), Nancy Bertin (CNRS - Rennes, France), Boaz Ophir, and Ron Rubinstein (CS, Technion).
37. November 10th 2011. *Invited Talk* at Final Workshop, Haifa Israel. Title: From SD to HD: Improving Video Sequences through Super-Resolution.
38. January 16th, 2012. *Invited Talk* at Mathematics and Image Analysis conference (MIA'06), Paris, France. Title: The Analysis Sparse Model - Definition, Pursuit, Dictionary Learning, and Beyond.
39. March 15th 2012. **Keynote Talk** at LVA/ICA, Herzlia Israel. Title: Analysis versus Synthesis Modeling of Data.
40. May 2012. *Invited Talk* at SIAM Imaging Science Conference, Philadelphia, USA. Title: The Analysis Sparse Model - Definition, Pursuit, Dictionary Learning, and Beyond (Short-Version). This talk was also given in a Machine-Learning Workshop in Janelia Farm (May, 2012). Joint work with Ron Rubinstein (former PhD student), Tomer Peleg (PhD student), Remi Gribonval and Sangnam Nam (INRIA, Rennes), and Mike Davies (UEdin).
41. August 2nd, 2012. The computer-vision seminar in the Hebrew University of Jerusalem (HUJI). Title: Generalized Tree-Based Wavelet Transform and Applications to Patch-Based Image Processing. Joint work with Idan Ram (PhD student) and Israel Cohen, both from the Electrical Engineering Department at the Technion.

42. April 2012 and May 2012. EE-Seminar in Tel-Aviv University, and also in the Weizmann Institute. Title: Sparse & Redundant Representation Modeling of Images: Theory and Applications.
43. November 23rd 2012. **Keynote Talk** - SIGMA'2012 (Signal-Image-Geometry-Modelling-Approximation), CIRM, Centre International de Rencontres Mathematiques, Luminy Campus Marseille. Title: Another Take on Patch-Based Image Processing.
44. December 7th, 2012. *Invited Talk* - NIPS 2012 workshop on the sparsity-based analysis model, Lake Tahoe, California. Title: Recent Results on the Co-Sparse Analysis Model.
45. December 12th 2012. *Invited Talk* - International Conference on Imaging Science 2012, Hong-Kong. Title: Another Take on Patch-Based Image Processing.
46. March 18, 2013. **Keynote Talk** - GAMM (SIAM Germany), Novi-Sad, Serbia. Title: Recent Results on the Co-Sparse Analysis Model.
47. May 28th, 2013. *Invited Talk* - 3rd Annual International TCE Conference on Machine Learning & Big Data, Technion, Israel. Title: Sparse Modeling of Graph-Structured Data and Images.
48. July 9th, 2013. **Keynote Talk** - SPARS13 EPFL, Lausanne. Title: Wavelet for Graphs and its Deployment to Image Processing.
49. March 13 - 15, 2014. **Plenary Talk** - Workshop on Mathematical Approaches to Large-Dimensional Data Analysis, Tachikawa, Tokyo. Title: Sparse Modeling of Graph-Structured Data ... and ... Images.
50. April 1st, 2014. **Plenary Talk** - Israel Machine Vision Conference (IMVC), April 1st, 2014, Tel-Aviv, Israel. Title: Image Processing via Pixel Permutation.
51. May 12 - 14, 2014. **Plenary Talk** - SIAM Imaging Science Conference, Hong-Kong. Title: Wavelet for Graphs and its Deployment to Image Processing.
52. January 25 - 30, 2015. *Invited Talk* - International BASP Frontiers Workshop, Villars sur Ollon, Switzerland. Title: SOS Boosting of Image Denoising Algorithms.
53. April 19 - 24, 2015. *Invited Talk* - ICASSP 2015, in the "School-of-ICASSP" Session, Brisbane Australia. Title: Sparse and Redundant Representation Modeling of Images: Theory and Applications.
54. December 7-11, 2015. **Plenary Talk** - 2nd International Conference on Compressed Sensing and its Applications (CSA 2015), Berlin, Germany. Title: The Dichotomy between Global Processing and Local Modeling.
55. June 6, 2016. *Invited Talk* - the Technion course "Scientific-Discoveries". Title: Atomic Decomposition of Images: Advanced Methods in Image Processing.
56. May 28, 2017. **Plenary Talk** - Workshop on Frame Theory and Sparse Representation for Complex Data, Institute for Mathematical Sciences – Singapore. Title: Multi-Layered Convolutional Sparse Coding – Theory and Applications.
57. September 4-8, 2017. **Plenary Talk** - IEEE-SPS Summer School on Signal Processing: Signal Processing Meets Deep Learning, Capri, Italy. Title: From Sparse Representations to Deep Learning.
58. September 17-20, 2017. **Plenary Talk** - ICIP 2017 - IEEE International Conference on Image Processing, Beijing, China. Title: Sparse Modeling in Image Processing and Deep Learning.

59. February 5-9, 2018. *Invited Talk* - IPAM 2018 - Workshop on New Deep Learning Techniques. Los Angeles, USA. Title: Sparse Modeling in Image Processing and Deep Learning.
60. March 6, 2018. **Plenary Talk** - Israel Machine Vision Conference (IMVC), Tel-Aviv, Israel. Title: Sparse Modeling in Image Processing and Deep Learning.

LONG TERM CONSULTING

- 2016 – Now Google Research
- 2013 – 2015 Nanometrics
- 2013 – 2014 CMT-Medical
- 2012 – 2012 Nova, Super-resolution algorithms.
- 2011 – 2012 Aspect Imaging - MRI Imaging (consultant).
- 2011 – 2013 BetterView - Video Processing - Super-Resolution (co-founder).
- 2003 – 2017 Agileye Technologies Ltd. - Video Processing for Security (co-founder).
- 2009 – 2009 Marvell - Optimization Algorithms (consultant).
- 2009 – 2009 MedicVision - Enhancement of Tomographic Imaging (consultant).
- 2007 – 2009 Xsights - Pattern Recognition for Mobile Services (CTO).
- 2006 – 2007 Novafora Inc. - Video Processing for Entertainment (consultant).
- 2003 – 2005 V-Target - Nuclear Medical Imaging (consultant).

POST DOCTORAL FELLOWS, RESEARCH ASSOCIATES AND GRADUATE STUDENTS

Post Docs and Research Associates:

1. Dr. Michael Zibulevsky, Research Associate, Expert in neural networks and optimization.
2. Dr. Amir Adler, Post Doctoral Fellow (May 2016 – February 2017), Deep learning for compressed-sensing applications.
3. Dr. Raja Giryes (February 2014 - July 2014 and February 2016 - September 2016), Advanced topics in sparse representations.
4. Dr. Dmitry Batenkov (June 2014 - March 2016), Local versus Global in Signal Modeling.
5. Dr. Esben Plenge (June 2014 - October 2015), Magnetic resonance imaging - Temporal reconstruction.
6. Dr. Wenze Shao (May 2014 - June 2015), Blind image restoration.

Graduated Ph.D.:

1. Michal Aharon (May 2004 – November 2006), Learning dictionaries for sparse representations.
2. Matan Protter (March 2006 – January 2011), The NL-Means algorithm and some extensions.
3. Ron Rubinstein (May 2004 – January 2012), Analysis versus synthesis in regularization of inverse problems.

4. Joseph Shtok (October 2007 – November 2012), Computerized tomography combined with sparse and redundant representations and learned dictionaries.
5. Idan Ram (October 2009 - December 2014), co-advisor: Israel Cohen, Processing of non-conventional structured data.
6. Raja Giryes (November 2009 - January 2014), Topics in sparse representation modeling.
7. Amir Adler (April 2010 - July 2014), co-advisor: Yacov Hel-Or, Subspace clustering via sparse representations.
8. Tomer Peleg (September 2011 - August 2014), Extensions of sparse representation modeling.
9. Javier Turek (March 2008 - July 2015), co-advisor: Irad Yavneh, Algorithms for MMSE estimator approximation for sparse modeling.
10. Boaz Ophir (November 2009 – May 2016), Multi-scale dictionary learning algorithms.
11. Vardan Papyan (September 2014 – September 2017), Global Versus Local Modeling of Signals.
12. Yaniv Romano (November 2012 – December 2017), Boosting patch-based image processing algorithms.
13. Jeremias Sulam (July 2013 - January 2018), Local versus global in patch-based image processing.

Graduated M.Sc.:

1. Einat Kidron (January 2004 - July 2005), co-advisor: Yoav Schechner, Video-audio localization via sparsity.
2. Boaz Matalon (May 2004 - November 2006), co-advisor: Michael Zibulevsky. Denoising using over-complete representations.
3. Dima Datsenko (February 2005 - November 2006), Example-based priors in inverse problems.
4. Svetlana Rabei (July 2004 - May 2007), co-advisor: Arie Feuer. On the recovery of missing samples via sparsity conditions.
5. Raviv Brueller (June 2005 – October 2007), co-advisor: Yacov Hel-Or (IDC). Face detection - Extensions of the MRC algorithm.
6. Ori Bryt (November 2006 – November 2009), Compression of face images using sparse and redundant representations and the K-SVD algorithm.
7. Raja Giryes (October 2007 – October 2009), co-advisor: Yonina Eldar, Automatic parameter tuning for inverse problems.
8. Neta Shoham (April 2007 – January 2010), Generalization of the K-SVD algorithm for pattern detection purposes.
9. Tomer Peleg (February 2010 - September 2011), co-advisor: Yonina Eldar, Molecule modeling: sparse representation modeling of data with atom interconnections.

10. Dana Segev (November 2008 - April 2012), co-advisor: Yoav Schechner, Multimodal signal processing using sparse representations.
11. Alona Zadneprovski (Golts) (July 2013 - June 2016), Kernel dictionary learning and applications.
12. Grisha Vaksman (March 2014 - June 2016), Patch ordering for Poisson inverse problems.
13. Arie Rond (September 2014 - June 2016), Poisson denoising by plug-and-play priors.
14. Yi Ren (June 2015 - December 2016), Synthesis of images.
15. David Boubilil (March 2014 - January 2018), Neural Networks and auto-encoders.

Current Post Doctoral Fellows and Research Associates:

1. Dr. Ives Rey-Otero (January 2017 – present), Graph Dictionary Learning.
2. Dr. Jeremias Sulam (January 2018 – present), Topics in Sparse Modeling.

Ph.D. Theses in Progress:

1. Yehuda Dar (October 2014 - present), co-advisor: Freddy Bruckstein, Novel compression for video via sparse representations.
2. Yael Yankelevsky (October 2014 - present), Signal processing on graphs.
3. Alona Golts, PhD Candidate.
4. Grisha Vaksman, PhD Candidate.

M.Sc. Theses in Progress:

1. Alon Brifman, M.Sc. (April 2015 - present), Still and Video Super-Resolution.
2. Amit Carmeli, M.Sc. (May 2015 - present), Blind video deblurring.
3. Stav Shapiro, (informal) M.Sc. (May 2015 - present), Super-resolution bounds using patch-context.
4. Dror Simon, M.Sc. (October 2017 - present), Improving Pursuit Algorithms Using Stochastic Resonance.
5. Ev Zisselman, M.Sc. (October 2017 - Present), Convolutional Sparse Coding using Sparse Dictionaries.
6. Aviad Averdam, M.Sc. (October 2017 - present).

RESEARCH GRANTS

2014 – 2018: Israel Science Foundation Grant (ISF): Advances in the Co-Sparse Analysis Model Theory and Practice. [198,000 NIS for the 1st year].

- 2013 – 2018: FP-7 ERC Advanced Grant: Next Generation Sparsity-Based Signal Modeling (SPARSE). [2,269,554 Euro].
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- 2012 – 2013: Google Inc: The Co-Sparse Analysis Model and its Use in Image Restoration. [36,857 USD].
- 2012 – 2013: HP Inc: Large Scale Data Analysis and Processing via Subspace Clustering. With Yakov Hel-Or. [70,000 USD].
- 2012 – 2013: Technion-Cornell Innovation Institute (TCII): Smart Sampling and Reconstruction for Magnetic Resonance Imaging. With Yi Wang. [60,000 USD].
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- 2011 – 2014: ONR - Office of Naval Research: Generalized Tree-Based Wavelet Transform for Sparse Representation. [16,000 USD].
- 2009 – 2012: European Commission, FP7, FET program: SMALL project. [360,080 Euro].
- 2008 – 2012: Israel Science Foundation Grant (ISF): Novel Super-Resolution Reconstruction Algorithms with no Explicit Motion-Estimation. [588,000 NIS].
- 2008 – 2012: Israel Science Foundation Grant (ISF): Auditory Computer-Vision. With Y. Schechner. [736,000 NIS].
- 2007 – 2009: Ministry of Industry, Trade and Labor. MAGNET program, (BMP consortium): Development and solutions of photonics technologies for spectroscopy diagnostics and treatment. With R. Kimmel. [app. 230,000 NIS (per year)].
- 2007 – 2008: Center for The Security Science and Technology, Technion. Jointly with R. Kimmel [29,000 USD].
- 2005 – 2009: USA-Israel Binational Science Foundation Grant: Analysis versus synthesis approaches in signal-priors for the solution of inverse problems. With D.L. Donoho and P. Milanfar. [21,375 USD per year].
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2. D.Sc. thesis: "Super resolution Reconstruction of Continuous Image", 1997, the Technion, Israel Institute of Technology.

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