

Date: 10/13/2017

RESUME

Full name: **Barak Fishbain**

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Date and place of birth: 25/1/1975, Haifa, Israel

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ACADEMIC DEGREES

Ph.D., 2009, School of Electrical Engineering, Faculty of Engineering, Tel-Aviv University, Tel-Aviv, Israel.

M.Sc., 2004, School of Electrical Engineering, Faculty of Engineering, Tel-Aviv University, Tel-Aviv, Israel.

B.Sc., 1997, Faculty of Electrical Engineering, Technion – Israel Institute of Technology, Haifa, Israel.

ACADEMIC APPOINTMENTS

Oct 2011 – Present, Assistant Professor, Division of Environmental, Water and Agriculture Engineering, Faculty of Civil and Environmental Engineering, Technion – Israel Institute of Technology, Haifa, Israel.

Oct 2015 – Sep 2016, Faculty, Team Project Chair, International Space University.

Oct 2010 – Oct 2011, Associate Director, Integrated Media System Center (IMSC), Viterbi School of Engineering, University of Southern California, Los-Angeles, CA, USA.

Oct 2008 – Feb 2011, Postdoctoral Fellow, Department of Industrial and Operations Research, University of California, Berkeley, CA, USA.

PROFESSIONAL EXPERIENCE

Oct 2005 – Oct 2008, Research Associate, National Simulations & Electronic Warfare Laboratory, Rafael – Advanced Defense Systems, Haifa, Israel.

Sep 1997 – Oct 2005, Research Officer, Intelligence Corps R&D Unit (Military P.O.B 02470), Israeli Defense Forces.

- Prime Minister Citation, Sep 2005
- Major General Citation (Intelligence Corps), Jan 2005
- Rank: Major

RESEARCH INTERESTS

My research focuses on *Enviromatics*, a new research field which aims at devising mathematical programming and pattern recognition methods for machine understanding of trends and behaviors of built and natural environments, based on multi-dimensional environmental data sets. This includes Environmental Distributed Sensing (i.e., distributed air and water quality monitoring), Safety and Traffic Data Realization and Structural Sensory Networks.

TEACHING EXPERIENCE**Technion:**

- Statistics (014003, undergraduate)
 - 2015, Excellence Teaching award (highest 12%)
 - 2017, Excellence Teaching award (highest 12%)
- Advanced Topics in Statistics (019007, graduate)
- Technion Pre-Clinical Research Authority (PCRA) (Statistics part in the introductory course, graduate)

Tel-Aviv University:

- Digital Image Processing, Applications (0510.7211 graduate)
- Introduction to Computer Networks (0512.4462 undergraduate, as teaching assistant)

Israeli Defense Force:

- Cyber and Software Engineering (Intelligence corps elite training program – חמ"ן תלפיות)

TECHNION ACTIVITIES

2015 – Division Undergraduate Studies Committee
Present,

2013 – Division Academic Secretary
Present,

PUBLIC PROFESSIONAL ACTIVITIES

Oct 2017 – Present, Secretary, [Emerging and Innovative Technologies Committee \(EITC\)](#), [Environmental & Water Resources Institute \(EWRI\)](#), [American Society of Civil Engineers \(ASCE\)](#)

Jul 2017 – Present, Management Committee, [COST Action CA16202, International Network to Encourage the Use of Monitoring and Forecasting Dust Products](#)

- Jul 2017 – Present, Executive Board, [Israel Society of Ecology and Environmental Sciences](#).
- May 2017 – Present Member, [Working Group 5.11, Computers and Environment, International Federation for Information Processing](#)
- Oct 2016 – Present, Associate Editor, [Journal of Mathematical Problems in Engineering](#)
- Nov 2010 – Present, Associate Editor, [Journal of Real-time Image Processing](#)
- Nov 2010 – Present, Advisory Board, [Journal of Real-time Image Processing](#)
- Jan 2010 – Nov 2010, Guest Editor, [Journal of Real-time Image Processing](#)
- Jun 2010, Panel Reviewer, National Science Foundation (NSF)
- Jun 2009, Panel Reviewer, National Science Foundation (NSF)

Reviewer:

- Science of the Total Environment
- Mathematical Problems in Engineering
- Journal of Operations Research
- Annals of Operations Research
- European Journal of Transport and Infrastructure Research
- IEEE Transactions on Circuits and Systems for Video Technology
- Optics Letters, Optical Society of America
- Journal of Optical Society of America A (JOSA A), Optical Society of America
- Journal of Real-time Image Processing

FELLOWSHIPS, AWARDS AND HONORS

- May 2017, **Goldberg Excellence in Research Award**, Alexander Goldberg Foundation, Technion – Israel Institute of Technology
- Jun 2016, **Best Poster Award: T. Yacobi, Y. Etzion and B. Fishbain**, "Assessing PM ambient levels from a set of still images", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.
- Jun 2016, **Best Poster Award Runner-up: A. Nebenzal and B. Fishbain**, "Long Term Forecasting of NO₂ in Metropolitan Areas Using the Discrete Time Markov Model", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.

- Feb 2015, **Best Poster Award:** *U. Lerner, T. Yacobi, I. Levy, S.A. Moltchanov, T. Cole-Hunter and B. Fishbain*, "The effect of ego-motion on environmental monitoring", *EPScon conference*, Weizmann Institute, Rehovot, Israel, 2015.
- Jul 2012, **Most Distinguished Program Graduate**, US Department of Homeland Security & US National Science Foundation (NSF)
- Oct 2008, **Research Scholar Excellence Award**, Ran Naor Foundation
- Dec 2007, **Research Student Excellence Award**, Applied Materials
- Nov 2007, **Rosenberg Excellence Award**, Faculty of Engineering, Tel-Aviv University
- Nov 2007, Israel Ministry of Science and Technology PhD **Research Fellowship**

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Member, Environmental and Water Research Institute (EWRI)

Member, American Society of Civil Engineers (ASCE)

Member, Operations Research Society of Israel (ORSIS)

GRADUATE STUDENTS

Completed PhD theses

- 6/2016 Gabriel Raviv, *Modeling of Near Misses Related to Crane Work at Construction Sites and their Safety Risk Potential*, with (primary advisor) Aviad Shapira.
- 1/2017 Uri Lerner, *Mathematical Data Analysis Methods for Air-Quality Wireless Distributed Environmental Sensor Networks*.
- 06/2017 Noa Avni, *Algorithms for development and management of regional water systems under multiple uncertainties*, with (secondary Advisor): Uri Shamir.

Completed MSc theses

- 1/2015 Ella Levi, *Online Oxidization of low concentrations of CP for enhancing bio sensors for early detection in drinking water*.
- 10/2015 Levi Frolich, *Spectral Methods for Analysis of Bacteria Counts in Water Wells*, with (secondary Advisor) Dalit Vizek-Ohayon (MEKOROT).
- 12/2015 Daphna Yogev, *Identification of water leakage using consumption patterns of domestic end users*.
- 12/2015 Oren Rubinstein, *Video based Identification and analysis of High-way traffic flow models*.
- 05/2017 Shai Moshenberg, *Imputation of missing air pollution data using spectral methods*.

PhD theses in progress

Tehila Asheri, *Data Driven Algorithms for Early Water Contamination in Water Supply Systems*.

Yaela N. Golumbic, *Public Participation in Air Quality Research in Haifa: Theory into Practice*, with (primary Advisor): Ayelet Baram-Tsabari.

Asaf Nebenzal, *Mathematical methods for Generating Accurate Dense Spatio-Temporal Maps of Air Pollutants from Sparse Sensing* (PhD in Applied Math).

MSc theses in progress

Tamar Yacobi, *Development and Utilization of New Methods for Urban Air-Pollution Monitoring*.

RESEARCH GRANTS

- 2017, Ministry of Environmental Protection, *Characterization, distribution and source apportionment of Ambient Ultrafine Particles in Haifa Bay Area*, 350,000 NIS (three yrs.), David Broday, Barak Fishbain and Yael Dubowski.
- 2014, MEKOROT, Israel National Water Company, *Algorithms for Early Contamination Detection in Water Supply Systems*, 140,000 NIS (four yrs.), Barak Fishbain
- 2013, The German Israeli Foundation for Scientific Research and Development (G.I.F), *Real-time Event Analysis Algorithms for Effective Multi-Source Environmental Monitoring*, 38,000 Euros (1 yr.), Barak Fishbain
- 2013, Cornel-Tech Foundation, *Adaptive Automatic Flow Control in Transportation Facilities*, 25,600 USD (1 yr.), Per-Olof Gutman, Barak Fishbain & Eilyan Bitar (Cornel University, Ithaca, NY).
- 2012, Environmental Health Foundation (EHF), *Traffic Air Pollution Exposure Assessment in an Urban Environment through Wireless Distributed Environmental Sensor Network*, 50,000 USD (3 yrs.), Barak Fishbain & Ilan Levi.
- 2012, European Commission, Directorate General for Research & Innovation, 7th Framework Program (FP7), *CITI Sense - Development of sensor-based Citizens' Observatory Community for improving quality of life in cities*, 260,000 Euros (four yrs.), David Broday & Barak Fishbain.
- 2012, Technion-Forschungszentrum Jülich-RWTH Aachen University umbrella cooperation Program, 9,000 Euros (one year), *Carbon based Sensory Textile Reinforced Concrete for Smart Structures*, Oded Rebinovich, Yiska Goldfeld, Barak Fishbain, Thomas Gries (RWTH Aachen University, Germany).
- 2011, Intel, *Real-time Traffic Monitoring through Traffic Videos*, 20,000 USD (1 yr.), Barak Fishbain

PUBLICATIONS

Theses

1. **B. Fishbain**, *Data Fusion Methods for Fusing Thermal and Visual Range Video Sequences*, M.Sc. Thesis, Tel-Aviv University, 06/2004.

2. **B. Fishbain**, *Real Time Methods for Restoration, Enhancement and Analysis of Videos with Applications in Intelligent Transportation Systems*, Ph.D. Thesis, Tel-Aviv University, 06/2008.

Refereed papers in professional journals

Published papers

1. I.A. Ideses, L.P. Yaroslavsky and **B. Fishbain**, "Real-Time 2D to 3D Video Conversion", *Journal of Real-Time Image Processing*, 2(1):3-9, 2007.
2. **B. Fishbain**, L.P. Yaroslavsky and I.A. Ideses "Real-time stabilization of long range observation system turbulent video", *Journal of Real- Time Image Processing*, 2(1):11-22, 2007.
3. L.P. Yaroslavsky, **B. Fishbain**, G. Shabat and I.A. Ideses, "Super-resolution in turbulent videos: making profit from damage", *Optics Letters*, 32(20):3038-3040, 2007.
4. **B. Fishbain**, L.P. Yaroslavsky and I.A. Ideses, "Spatial, Temporal, and Inter-channel Image Data Fusion for Long-Distance Terrestrial Observation Systems", *Advances in Optical Technologies*, Vol. 2008, Article ID 546808, 2008.
5. **B. Fishbain**, I.A. Ideses, G.Shabat, B.G. Salomon and L.P. Yaroslavsky, "Superresolution in color videos acquired through turbulent media", *Optics Letters*, 34(5):587-589, 2009.
6. L.P. Yaroslavsky, G. Shabat, I.A. Ideses, B.G. Salomon and **B. Fishbain**, "Non-uniform signal sampling, signal and image recovery from sparse data and the discrete sampling theorem", *Journal of Optical Society of America A.*, 26(3):566-575, 2009.
7. *J. Griswold*, **B. Fishbain**, D.R. Ragland, and S. Washington, "Visual assessment of pedestrian crashes", *Accident Analysis and Prevention*, 43(1):301-306, 2011.
8. D.S. Hochbaum and **B. Fishbain**, "Nuclear Threat Detection with Mobile Distributed Sensor Networks", *Annals of Operations Research*, 187(1):45-63, 2011.
9. **B. Fishbain**, D. Hochbaum, and Y.T. Yang. "A new approach for real-time target tracking in videos", *SPIE Newsroom*, DOI: 10.1117/2.1201301.004648, Jan 2013.
10. **B. Fishbain** and *O. Grembeck*, "A Multi-Dimensional Clustering Algorithm for Studying Fatal Road Crashes", *Journal of Transportation and Statistics*, 10(1):79-100, 2013.
11. Y.T. Yang, **B. Fishbain**, D.S. Hochbaum, E.B. Norman and E. Swanberg, "The Supervised Normalized Cut Method for Detecting, Classifying, and Identifying Special Nuclear Materials", *INFORMS Journal on Computing*, 26(1):45-58, 2014.
12. *S. Molchanov*, *I. Levy*, Y. Etzion, *U. Lerner*, D.M. Broday and **B. Fishbain**, "On the feasibility of measuring urban air-pollution by wireless distributed sensor networks", *Science of the Total Environment*, 502:537-547, 2015.
13. *U. Lerner*, *T. Yacobi*, *I. Levy*, *S. Moltchanov*, **B. Fishbain**, "The effect of ego-motion on Environmental Monitoring", *Science of the Total Environment*, 533:8-16, 2015.

14. N. Avni, **B. Fishbain** and U. Shamir, "Water consumption patterns as a basis for water demand modeling", *Water Resource Research*, 51(10):8165-8181, 2015.
15. S. Moshenberg, U. Lerner and **B. Fishbain**, "Spectral Methods for Imputation of Missing Air Quality Data", *Environmental Systems Research*, 4(26):1-13, 2015.
16. Y. Goldfeld, O. Rabinovitch, **B. Fishbain**, T. Quadflieg and T. Gries, "Sensory Carbon Fiber based Textile-Reinforced Concrete for Smart Structures", *Journal of Intelligent Material Systems and Structures*, 27(4):469-489, 2016.
17. **B. Fishbain**, D.S. Hochbaum and S. Mueller, "A competitive study of the pseudoflow algorithm for the minimum $s-t$ cut problem in vision applications", *Journal of Real-Time Image Processing*, 11:589-609, 2016.
18. **B. Fishbain** and E. Moreno-Centeno, "Self-Calibrated Wireless Distributed Environmental Sensory Networks", *Scientific Reports*, 6:24382; doi: 10.1038/srep24382, 2016.
19. G. Raviv, **B. Fishbain** and A. Shapira, "Analyzing risk factors in crane- related near-miss and accident reports", *Safety Science*, 91:192-205, 2017.
20. G. Raviv, A. Shapira and **B. Fishbain**, "AHP-based analysis of the risk potential of safety incidents: Case study of cranes in the construction industry", *Safety Science*, 91:298-309, 2017.
21. **B. Fishbain**, U. Lerner, T. Cole-Hunter, N. Castell, O. Popoola, D.M. Broday, T. Martinez Iñiguez, M. Nieuwenhuijsen, M. Jovasevic- Stojanovic, D. Topalovic, R.L. Jones, K. Galea, Y. Etzion, F. Kizel, Y.N. Golumbic, A. Baram-Tsabari, J.A. Robinson, D. Kocman, M. Horvat, V. Svecova, A. Arpacı and A. Bartonova, "An Evaluation Tool Kit of Air Quality Micro-Sensing Units", *Science of the Total Environment*, 575(1):639-648, 2017.
22. N. Castell, F.R. Dauge, P. Schneider, M. Vogt, U. Lerner, **B. Fishbain**, D.M. Broday and A. Bartonova, "Can commercial low-cost sensor platforms contribute to air quality monitoring and exposure estimates?", *Environment International*, 99:293–302, 2017.
23. L.D. Frolich, D. Vizel-Ohayon, and **B. Fishbain**, "Spectral Methods for the Analysis of Bacteria in Water Wells", *Scientific Reports*, 7:799; doi 10.1038/s41598-017-00830-4, 2017.

Accepted papers

24. Y.N. Golumbic, D. Orr, A. Baram-Tsabari and **B. Fishbain**, "Between Vision and Reality: A Case Study of Scientists' Views on Citizen Science", *Citizen Science: Theory and Practice*.
25. U. Lerner, O. Hirshfeld and **B. Fishbain**, "Optimal Deployment of a Heterogeneous Environmental Sensor Network", *Journal of Environmental Informatics*.

Peer reviewed publications

26. **B. Fishbain**, S. Moshenberg and U. Lerner, "Optimal Noise Filtering of Sensory Array Gaseous Air Pollution Measurements", *Advances and New Trends in Environmental Informatics*, 275-285, 2017.
27. A. Nebenzal and **B. Fishbain**, "Hough-based Interpolation Scheme for Generating Accurate Dense Spatial Maps of Air Pollutants from Sparse Sensing", *International Federation for*

Information Processing (IFIP) Advances in Information and Communication Technology, 2017.

28. **B. Fishbain** and E. Yafe, "Initial Assessment of Air Pollution and Emergency Ambulance Calls in 35 Israeli Cities", *Advances and New Trends in Environmental Informatics*, 2018.

Submitted papers

1. A. Nebenzal and **B. Fishbain**, "Long Term Forecasting of Nitrogen Dioxide in Metropolitan Areas Using the Discrete Time Markov Model".
2. T. Asheri Arnon, S. Ezra and **B. Fishbain**, "A Novel Approach to Distinguish between Different Drinking Water Sources and to Assess Water Quality, Using UV-Spectrophotometer".
3. F. Kizel, Y. Etzion, R. Shafran-Nathan, I. Levy, **B. Fishbain**, A. Bartonova and D. Broday, "Node-to-Node Field Calibration of Wireless Distributed Air Pollution Sensor Network".

In Preparation

1. H.N. Nguyen and **B. Fishbain**, "On the Dynamic Nature of the Macroscopic Fundamental Diagram".
2. N. Avni and **B. Fishbain**, "Frequency Transform Based Implicit Stochastic Programming Sequence Generator in Water Systems Modeling".

Books and chapters in books

1. **B. Fishbain**, *Surveillance, Monitoring and Traffic Video Systems*, VDM-Verlag Pub., Berlin, Germany, pp. 160, 2009. ISBN: 978-3-639-15240-1.
2. **B. Fishbain**, "Framework for Analyzing Environmental Indicators Measurements Acquired by Wireless Distributed Sensory Network - Air Pollution showcase", *Environmental Indicators* (Eds. R. Armon & O. Hänninen), 207-223, Springer, 2015.

Refereed papers in conference proceedings

1. Sh. Gepshtein, A. Shtainman, **B. Fishbain** and L.P. Yaroslavsky, "Restoration of atmospheric turbulent video containing real motion using elastic image registration", *Proc. the 2004 European Signal Processing Conference (EUSIPCO-2004)*, 477-480, Vienna, Austria, 6-10 September 2004.
2. L.P. Yaroslavsky, **B. Fishbain**, A. Shtainman and Sh. Gepshtein, "Processing and Fusion of Thermal and Video Sequences for Terrestrial Long Range Observation Systems", *Proc. the 7th International Conference on Information Fusion*, 848-855, Stockholm, Sweden, June 2004.
3. L.P. Yaroslavsky, **B. Fishbain**, I.A. Ideses, D. Slasky and Z. Hadas, "Simple methods for real time stabilization of turbulent video", *ICO Topical Meeting on Optoinformatics*, 138-140, Saint-Petersburg, Russia, 4-7 September 2006.
4. L.P. Yaroslavsky, I.A. Ideses, **B. Fishbain**, R. Vistuch and L. Ridel, "3D Video from 2D MPEG streams, Methods and applications", *ICO Topical Meeting on Optoinformatics*, 136-137, Saint-Petersburg, Russia, 4-7 September 2006.

5. **B. Fishbain**, L.P. Yaroslavsky, I.A. Ideses, A. Shtern, and O. Ben-Zvi, "Real-time stabilization of long-range observation system turbulent video", *Proc. Real-Time Image Processing/Electronic Imaging 2007*, SPIE 6496:12-22, San-Jose, CA, USA, 28 January - 1 February 2007.
6. I.A. Ideses, L.P. Yaroslavsky, **B. Fishbain** and R. Vistuch, "3D video from compressed 2D video", *Proc. Stereoscopic Displays and Applications XVIII/Electronic Imaging*, SPIE 6490:28-35, San-Jose, CA, USA, 28 January - 1 February 2007.
7. I.A. Ideses, L.P. Yaroslavsky, I. Amit and **B. Fishbain**, "Depth map Quantization how much is Sufficient?", *Proc. 3DTV-Conference, Capture, Transmission and Display of 3D Video*, 1-4, Kos Island, Greece, 7-9 May 2007.
8. **B. Fishbain**, L.P. Yaroslavsky and I.A. Ideses, "Real Time Turbulent Video Perfecting by Image Stabilization and Super-resolution", *Proc. 7th IASTED International Conference on Visualization, Imaging, and Image Processing (VIIP 2007)*, 213-218, Palma de Mallorca Spain, 29-31 August 2007.
9. I.A. Ideses, L.P. Yaroslavsky and **B. Fishbain**, "Depth Maps: Faster, Higher and Stronger?", *Proc. Three-Dimensional Image Capture and Applications/Electronic Imaging 2008*, SPIE 6805:1-11, San- Jose, CA, USA, 28 January - 1 February 2008.
10. L.P. Yaroslavsky, A. Agranovich, **B. Fishbain** and I.A. Ideses, "Precise differentiation can significantly improve the accuracy of optical flow measurements", *Proc. Image Processing: Algorithms and Systems VI/Electronic Imaging 2008*, SPIE 6812:11-19, San-Jose, CA, USA, 28 January - 1 February 2008.
11. L.P. Yaroslavsky, G. Shabat, **B. Fishbain** and I.A. Ideses, "Super- Resolution of Turbulent Video: Potentials and Limitations", *Proc. Image Processing: Algorithms and Systems VI/Electronic Imaging 2008*, SPIE 6812:5-13, San-Jose, CA, USA, 28 January - 1 February 2008.
12. **B. Fishbain**, L.P. Yaroslavsky, I.A. Ideses and F. Roffet-Crete, "No- Reference Method for Image Effective Bandwidth Estimation", *Proc. Image Quality and System Performance V/Electronic Imaging 2008*, SPIE 6808:0X-1 – 0X-11, San-Jose, CA, USA, 28 January - 1 February 2008.
13. **B. Fishbain**, L.P. Yaroslavsky and I.A. Ideses, "Real Time Turbulent Video Super-Resolution Using MPEG 4", *Proc. Real-Time Image Processing/Electronic Imaging 2008*, SPIE 6811:6-9, San-Jose, CA, USA, 28 January - 1 February 2008.
14. I.A. Ideses, **B. Fishbain** and L.P. Yaroslavsky, "Depth Map Manipulation for 3D Visualization", *Proc. IEEE 3DTV Conference*, 337 – 340, Istanbul Turkey, 28-30 May 2008.
15. L.P. Yaroslavsky, G. Shabat, **B. Fishbain**, B. G. Salomon and I. A. Ideses, "Non-uniform sampling, signal and image recovery from sparse data and the discrete sampling theorem", *Proc. Algorithms and Systems VII/Electronic Imaging 2009*, SPIE 7245A, San-Jose, CA, USA, 18-22 January 2009.

16. I.A. Ideses, L.P. Yaroslavsky and **B. Fishbain**, "Real-Time Depth Map Manipulation for 3D Visualization", *Proc. Real-time Image and Video Processing/Electronic Imaging 2009*, SPIE 7244:72440J-1 - 72440J-8, San-Jose, CA, USA, 18-22 January 2009.
17. **B. Fishbain**, I.A. Ideses, D. Mahalel and L.P. Yaroslavsky, "Real-Time Vision-Based Traffic Flow Measurements and Incident Detection", *Proc. Real-time Image and Video Processing/Electronic Imaging 2009*, SPIE 7244: 72440I-1 - 72440I-12, San-Jose, CA, USA, 18-22 January 2009.
18. **B. Fishbain**, Y.T. Yang and D.S. Hochbaum, "Real-time, Robust Target Tracking in Videos via Graph-cuts", *Real-Time Image and Video Processing/Electronic Imaging 2013*, SPIE 8656: 865602-1 – 865602-9, San-Francisco California, February 5-6, 2013.
19. Y. Etzion, D.M. Broday and **B. Fishbain**, "Analysis of image color and effective bandwidth as a tool for assessing air pollution at urban spatiotemporal scale", *Computational Imaging XI/Electronic Imaging 2013*, SPIE 8657:86570U-1 - 86570U-11, San-Francisco California, February 5-6, 2013.
20. N. Avni, **B. Fishbain**, and U. Shamir, "Pattern recognition in water demand data", *Proc. World Environmental & Water Resources Congress*, Portland, OR, USA, June 1-5, 2014.
21. Y. Goldfeld, O. Rabinovitch, T. Quadflieg, **B. Fishbain**, and T. Gries, "Smart Textile Reinforced Concrete Sensory Structures", *7th European Workshop on Structural Health Monitoring*, La Cité, Nantes, France, July 8-11, 2014.
22. G. Raviv, A. Shapira, and **B. Fishbain**, "Analyzing and modelling near misses in crane-work environments", *ARCOM Doctoral Workshop on Health, Safety and Wellbeing*, Association of Researchers in Construction Management, Lincoln, UK, September 7-9, 2015.
23. G. Raviv, A. Shapira and **B. Fishbain**, "Systematic Approach to Crane-Related Near-Miss Analysis", *8th International Conference on Construction in the 21st Century*, Thessaloniki, Greece, May 27-30, 2015.
24. H-N Nguyen, **B. Fishbain**, E. Bitar, D. Mahalel, P-O Gutman, "Systematic Approach to Crane-Related Near-Miss Analysis", *14th IFAC Symposium on Control in Transportation Systems (CTS 2016)*, Istanbul, Turkey, May 18-20, 2016.
25. Y.N. Golumbic, A. Baram-Tsabari and **B. Fishbain**, "Increased knowledge and scientific thinking following participation of school students in air-quality research", *The 14th International Conference of Indoor Air Quality and Climate*, Ghent, Belgium, July 3-8, 2016.
26. S. Moshenberg, U. Lerner and **B. Fishbain**, "Optimal Noise Filtering in Atmospheric Pollution Measurements of Sensory Array", *EnviroInfo 2016*, Berlin, Germany, Sep. 13–16, 2016.
27. D. Brack, S. Scepanovic and **B. Fishbain**, "Mapping and optimizing big space data - an international, Interdisciplinary and intercultural perspective on the space related data processes", *67th International Astronautic Congress*, Guadalajara, Mexico, 26–30 September, 2016.

28. A. Nebenzal and **B. Fishbain**, "Hough-based Interpolation Scheme for Generating Accurate Dense Spatial Maps of Air Pollutants from Sparse Sensing", *International Symposium on Environmental Software Systems*, Zadar, Croatia, 10-12 May, 2017.
29. **B. Fishbain** and E. Yafe, "Initial Assessment of Air Pollution and Emergency Ambulance Calls in 35 Israeli Cities", *EnviroInfo 2017*, Belval, Luxembuorg, 13-15 Sep 2017.

Patents

1. I.A. Ideses, L.P. Yaroslavsky, **B. Fishbain** and R. Vistuch, "Methods and Systems for Use in 3D Video Generation, Storage and Compression", *US Patent #20080205791*, 28-8-2008.
2. **B. Fishbain**, I.A. Ideses and L.P. Yaroslavsky, "An Apparatus and Method for Real-time Super-resolution which Incorporates the Family of ITU and MPEG Video Coding Standards", *US Patent #20100272184*, 28-10-2010.
3. T. Asheri, S. Ezra, and **B. Fishbain**, "Detecting Contaminants via Machine Learning", *US Provisional Patent #62/133,635*, 18-3-2015.

Other publications

1. **B. Fishbain** and Mehrubeoglu, Mehrube, "Editorial of the special issue on real-time vision-based motion analysis and intelligent transportation systems", *Journal of Real-Time Image Processing*, 5(4):213-214, 2010.
2. Y.N. Golumbic, A. Baram-Tsabari, and **B. Fishbain**, "Citizen science: Public participation in scientific research" (Review), *Ecology and the Environment*, 6(1):14-23, 2015. (In Hebrew).
3. J. Wachs, M. Mejail, **B. Fishbain**, L. Alvarez, "Editorial of the special issue on Real-Time Image and Video Processing for Pattern Recognition Systems and Applications", *Journal of Real-Time Image Processing*, 11(2):247-249, 2016.
4. Y.N. Golumbic, A. Baram-Tsabari, and **B. Fishbain**, "Making Scientific Data Accessible to the Public", *Ecology and the Environment*, 8(3):5-6, 2017. (In Hebrew).

CONFERENCES

Plenary, keynote or invited talks

1. **B. Fishbain**, Y.T. Yang and D.S. Hochbaum, "Real-time, Robust Target Tracking in Videos via Graph-cuts", *Real-Time Image and Video Processing/Electronic Imaging 2013*, SPIE 8656: 865602-1 – 865602-9, San-Francisco California, February 5-6, 2013 (invited talk).

Presentations

2. L. Mihailescu, **B. Fishbain**, D.S. Hochbaum, J. Maltz, C.J. Moore, J. Rohel, L. Supic and K. Vetter, "Dynamic stand-off 3D gamma-ray imaging", *12th Symposium on Radiation Measurements and Applications (SORMA)*, University of Michigan - Ann Arbor, USA, 24-27 May, 2010.
3. Y.T. Yang, **B. Fishbain**, D.S. Hochbaum, E.B. Norman and E. Swanberg "Multi-Pronged Approach for Detecting, Classifying and Identifying Special Nuclear Materials", *12th INFORMS Computing Society Conference*, Monterey, California, January 9-11, 2011.

4. **B. Fishbain**, D.S Hochbaum and Stefan Mueller, "Competitive Analysis of Minimum-Cut Maximum Flow Algorithms in Vision Problems", *12th INFORMS Computing Society Conference*, Monterey, California, January 9-11, 2011.
5. **B. Fishbain**, Y.T. Yang and D.S. Hochbaum, "Segmentation and Target Tracking Using Pseudoflow Algorithm Through Joint Utilization of Color and Coarse Motion Data", *12th INFORMS Computing Society Conference*, Monterey, California, January 9-11, 2011.
6. Y. Etzion, D.M. Broday, **B. Fishbain**, "Assessing PM Concentrations at Urban Spatiotemporal Scale by Image Analysis Based on the Image Effective Bandwidth Measure", *American Association for Aerosol Research 32nd Annual Conference*, Portland Oregon, September 30-October 4, 2013.
7. D.M. Broday, **B. Fishbain**, Y. Etzion, I. Levy, "Evaluation of Low-Cost PM Sensors, Intended for Use in a Dense Monitoring Grid", *American Association for Aerosol Research 32nd Annual Conference*, Portland Oregon, September 30-October 4, 2013.
8. J. Shashank, I. Levy, **B. Fishbain**, and D.M. Broday, "Application of distributed sensor networks for estimating exposures to air pollution in urban areas", *Conference of ISEE, ISES and ISIAQ on Environment and Health*, Basel, Switzerland August 19 - 23, 2013.
9. Y. Etzion, **B. Fishbain**, and D.M. Broday, "Assessing exposure to ambient air pollution at the urban temporal scale by analysis of image color and effective bandwidth", *Conference of ISEE, ISES and ISIAQ on Environment and Health*, Basel, Switzerland, August 19 - 23, 2013.
10. U. Lerner, T. Yacobi, I. Levy, S.A. Moltchanov, T. Cole-Hunter and **B. Fishbain**, "The effect of ego-motion on environmental monitoring", EPScon 2015 conference, Weizmann Institute, Rehovot, Israel.
11. Y.N. Golumbic, A. Baram-Tsabari, and **B. Fishbain**, "Participation of schools in scientific air quality research", *Annual Science and Environment Conference*, Hebrew University, Jerusalem, Israel, October 12-14, 2015.
12. N. Castell, U. Lerner, **B. Fishbain**, F. René Dauge, P. Schneider, M. Vogt and A. Bartonova, "Can low-cost sensors contribute to air quality assessment and citizen science?", *1st International European Citizen Science Association (ECSA) Conference*, Berlin, Germany, May 19–21, 2016.
13. Y.N. Golumbic, **B. Fishbain** and A. Baram-Tsabari, "Empowering citizens through citizen science. CITI-SENSE - The case study of Haifa, Israel", *1st International European Citizen Science Association (ECSA) Conference*, Berlin, Germany, May 19–21, 2016.
14. N. Avni, **B. Fishbain**, M. Housh, U. Shamir, "The Effect of Water Demand Uncertainty on Management of Regional Water Systems", *World Environmental & Water Resources Congress*, West Palm Beach, FL, USA, May 22–26, 2016.
15. T. Yacobi, Y. Etzion and **B. Fishbain**, "Assessing PM ambient levels from a set of still images", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.

16. A. Nebenzal and **B. Fishbain**, "Long Term Forecasting of NO₂ in Metropolitan Areas Using the Discrete Time Markov Model", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.
17. U. Lerner and **B. Fishbain**, "Sensor Evaluation Toolkit (SET) for assessing Micro Sensing Air Quality Units", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.
18. Y.N. Golumbic, **B. Fishbain** and A. Baram-Tsabari, "Citizen guided design of Air Quality Information Dissemination System", *2016 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.
19. T. Yacobi, Y. Etzion, R. Jayaratne, M.M. Rahman, L. Morawska and **B. Fishbain**, "Assessing Exposure to Ambient Fine Particulate Matter Based on Digital Imagery", *International Society for Environmental Epidemiology Conference 2016*, Rome, Italy, September 1–4, 2016.
20. U. Lerner, O. Hirshfeld and **B. Fishbain**, "Optimal Deployment of a Heterogeneous Environmental Sensor Network", *International Society for Environmental Epidemiology Conference 2016*, Rome, Italy, September, 1–4, 2016.
21. T. Yacobi, Y. Etzion, R. Jayaratne, M.M. Rahman, L. Morawska and **B. Fishbain**, "Quality of Digital Images as Means of Ambient Fine PM Assessment", *22nd European Aerosol Conference*, Tours, France, September 4–9, 2016.
22. N. Avni, **B. Fishbain** and U. Shamir, "Regional Water Supply System Management Under Demand Uncertainty: Using Aggregation Rules to Derive an Operation Policy from Implicit Stochastic Programming Models", *World Environmental & Water Resources Congress*, Sacramento, CA, USA, May 21–25, 2017.
23. L. Frolich, **B. Fishbain**, "Spectral Methods for the Analysis of Bacteria Counts in Water Wells", *World Environmental & Water Resources Congress*, Sacramento, CA, USA, May 21–25, 2017.
24. L. Perlman-Sela, "Integrated information modeling for resilient water infrastructure systems", *World Environmental & Water Resources Congress*, Sacramento, CA, USA, May 21–25, 2017.
25. Y.N. Golumbic, **B. Fishbain** and A. Baram-Tsabari, "Presenting Scientific Data to Layman Users Practices", *2017 Annual convention of the Israel Society of Ecology and Environmental Sciences*, Tel-Aviv, Israel, June 21–23, 2016.

Participation in organizing conferences

7th IASTED International Conference on Visualization, Imaging, and Image Processing, (VIIP 2007), Palma de Mallorca Spain, 29-31 August, 2007.Session Chair.

1st Workshop on Special Topics in Homeland Nuclear Security, Berkeley, CA, USA, July 22-24, 2009.Organization Committee, Coordinator.

Real-Time Image and Video Processing, SPIE Photonics Europe, Brussels Belgium, April 12-16, 2010. Organization Committee.

- 12th INFORMS Computing Society Conference, Monterey, CA USA, January 9–11, 2011.
 Organization Committee.
- Real-Time Image and Video Processing, SPIE, San Francisco, CA, USA, January, 23-27, 2011.
 Organization Committee.
- The 4th ACM SIGSPATIAL International Workshop on Computational Transportation Science (IWCTS 2011), November 1, 2011, Chicago, Illinois, USA. Program Committee.
- Real-Time Image and Video Processing, SPIE, San Francisco, CA, USA, January, 22-26, 2012.
 Organization Committee.
- The 5th ACM SIGSPATIAL International Workshop on Computational Transportation Science (IWCTS 2012), November 6, 2012, Redondo Beach, CA, USA. Program Committee.
- Real-Time Image and Video Processing, SPIE, San Francisco, CA, USA, February, 3 – 7, 2013.
 Organization Committee.
- Real-Time Image and Video Processing, SPIE, Brussels Belgium, April, 14-17, 2014.
 Program Committee.
- Real-Time Image and Video Processing, SPIE, San Francisco, CA, USA, February 8 – 12, 2015.
 Program Committee.
- Real-Time Image and Video Processing, SPIE, Brussels, Belgium, April 7, 2016. Program Committee.
- Environmental & Water Resources Institute (EWRI) Congress, West Palm Beach, FL, USA, May 22–26, 2016. Session Chair.
- 2016 Annual convention of the Israel Society of Ecology and Environmental Sciences, Tel-Aviv, Israel, June 21–23, 2016. Session Chair.
- Security and Sensing Symposium, SPIE, Anaheim, CA, USA, 9–13 April 2017. Program Committee.
- Environmental & Water Resource Institute (EWRI) Congress, American Society of Civil Engineers (ASCE), Sacramento, CA, USA, 21-25 May 2017. Session Chair, Program Committee.
- Enviroinfo, Belval, Luxembuorg, 13-15 Sep 2017. Program Committee.
- Emerging and Innovative Technologies Track, Environmental & Water Resources Institute Congress (EWRI), 20-24 May 2018. Track Co-Chair.
- Real-Time Image and Video Processing, SPIE, Orlando Florida, USA, April 15-19, 2018.
 Program Committee.