

Barak Fishbain (May 2010)

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College of Engineering
Department of Industrial Engineering and Operations Research (IEOR)
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1. Awards and Fellowships

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| <u>Post Doctoral Fellowship</u>
<i>University of California at Berkeley</i> , Berkeley, CA
College of Engineering | Oct. 2008 – today |
| <u>Ran Naor Road Safety Research Foundation Scholar</u>
<i>The Technion, Israel Institute of Technology</i> ,
Haifa, Israel | Oct. 2008 – Oct. 2009 |
| <u>Applied Materials Research-Student Excellency Award</u>
<i>Applied Materials</i> , Inc.
Global leader in nano-manufacturing technology solutions | Dec. 2007 |
| <u>Rosenberg Excellency Award</u>
<i>Tel-Aviv University</i> , Tel-Aviv, Israel
Faculty of Engineering | Nov. 2007 |
| <u>PhD Research Fellowship</u>
<i>Israel Ministry of Science Culture and Sport</i> , Israel | Nov. 2007 – Nov. 2008 |
| <u>PhD Research Student Scholarship</u>
<i>Tel-Aviv University</i> ,
Faculty of Engineering, Tel-Aviv, Israel
Zandman-Slaner School for Graduate Studies | Nov. 2005 – Nov. 2008 |

2. Academic Activities

2.1. Guest Editor

- *Journal of Real-time Image Processing* special issue on Real-Time Vision-Based Motion Analysis and Intelligent Transportation Systems

2.2. Reviewer

- National Science Fund Panelist
- IEEE Transactions on Circuits and Systems for Video Technology
- Optic Letters, Optical Society of America
- Journal of Optical Society of America A (JOSA A), Optical Society of America
- Journal of Real-time Image Processing (JRTIP), Springer

2.3. Conferences - Organization Committees

- 1st Workshop on Special Topics in Homeland Nuclear Security, Berkeley CA., Aug 2009.
- Real-Time Image and Video Processing Conference, Photonics Europe 2010, Brussels, Belgium, Apr. 2010.

3. Education

10/2005 – 9/2008 PhD

“Vision-Based Automatic Incident Detection and Analysis”

Advisors

Professor L.P. Yaroslavsky
Tel Aviv University

Professor David Mahalel
The Technion - The Israeli
Institute of Technology

11/2000 – 6/2004 M.Sc.

Tel-Aviv Israel, Tel-Aviv University, Faculty of Engineering

Thesis Title

“Data Fusion Methods for Fusing Thermal and Visual Range Video Sequences”

Advisor: Professor L.P. Yaroslavsky

10/1993 – 4/1997 B.Sc.

Israel Haifa, The Technion Israeli Institute of Technology,
Faculty of Electrical Engineering.

4. Professional Experience

4.1. Funded Research Projects

Dates	Funding Organization	Subject of Research
10/2008 today	– University of California at Berkeley	The DONUTS Initiative
10/2007 10/2008	– Israeli ministry of Transportation & Israeli Ministry of science culture and sport	Incident detection in Video Intelligent Transportation Systems.
11/2006 03/2008	- Israeli Defense Advanced Research Projects Agency (MAFAT)	Real time Long range imaging systems real-time noise filtering in 3D (time and space) domain.
11/2005 2/2007	– Elbit Systems Electro- Optics (El-Op)	Turbulent video stabilization with the presence of real motion.

4.2. Work Experience

10/2005 – 10/2008 **Research Associate**
Data Networks Research Center
Rafael – Advanced Defense Systems National Laboratory

9/1997 – 10/2005 **Developing engineer, Project manager and team leader**

Israeli Defense Forces,
Intelligence Corps Engineering R&D Unit
Military Rank – Major

1/2005 OC Command Citation ציון לשבח – ראש אגף מודיעין

Awarded by a Major General, director of Israeli military intelligence for outstanding technological achievements.

9/2005 Prime Minister Citation ציון לשבח מטעם ראש הממשלה

Awarded by the Israeli Prime Minister for leading a technological research project in the field of telecommunication.

4.3. Teaching Experience

11/2005 – 7/2008 **Teaching Assistant**
Tel-Aviv Israel, Tel-Aviv University,

- Computer Networks
- Digital Image Processing

5. Publications

5.1. Books

- B. Fishbain, *Surveillance, Monitoring and Traffic Video Systems*, VDM-Verlag Pub., Berlin, Germany. 2009. ISBN: 978-3-639-15240-1.

5.2. Journal Papers

- D. S. Hochbaum, B. Fishbain, “Nuclear Threat Detection with Mobile Distributed Sensor Networks”, *Annals of Operations Research (to appear)*
- L. P. Yaroslavsky, G. Shabat, B. Fishbain, I. A. Ideses, B. G. Salomon, “Non-uniform signal sampling, signal and image recovery from sparse data and the discrete sampling theorem”, *Journal of Optical Society of America A.*, Vol. 26, Issue 3, pp. 566-575 (March 2009)
- B. Fishbain, G. Shabat, I. A. Ideses, B. G. Salomon, L. P. Yaroslavsky, “Super-resolution in color turbulent videos”, *Optics Letters*, 34, 587-589 (2009).

- B. Fishbain, L.P. Yaroslavsky and I.A. Ideses, “Spatial, Temporal, and Interchannel Image Data Fusion for Long-Distance Terrestrial Observation Systems,” *Advances in Optical Technologies*, vol. 2008, Article ID 546808, 2008. doi:10.1155/2008/546808
- L.P. Yaroslavsky, B. Fishbain, G. Shabat and I. Ideses, "Super-resolution in turbulent videos: making profit from damage", *Optics Letters*, Vol. 32(20), pp. 3038-3040, 2007.
- 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*, Vol.2(1), pp. 11-22, Oct. 2007.
- I. Ideses, L. Yaroslavsky and B. Fishbain, “Real-Time 2D to 3D Video Conversion”, *Journal of Real-Time Image Processing*, Vol.2(1), pp. 3-9, Oct. 2007.
- B. Fishbain, D.S. Hochbaum, S. Mueller, “Competitive Analysis of Minimum-Cut Maximum Flow Algorithms in Vision Problems”, *IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI)* (*Submitted*).
- B. Fishbain, D.S. Hochbaum, Y.T. Yang, “Video Segmentation Using Pseudoflow Algorithm Through Utilization of Intensity and Coarse Motion Data”, *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)* (*Submitted*)
- J. Griswold, B. Fishbain, D.R. Ragland, S. Washington, “A Novel Approach to Understanding Temporal and Lighting Effects on Pedestrian-Involved Fatal Collisions”, *Accident Analysis and Prevention* (*Submitted*).

5.3. Patents

- B. Fishbain, I. A. Ideses, 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 (Pending) filed 10-Jan-2009.
- I. A. Ideses, B. Fishbain, L. P. Yaroslavsky, R. Vistuch, "Methods and Systems for Use in 3D Video Generation, Storage and Compression", US Patent (Pending) filed 13-Oct-2007.

5.4. Manuscripts

- D.S. Hochbaum, B. Fishbain, J.E. Baumler, and G.E. Gold, “Automated and semi-automated knee cartilage segmentation using graph cuts”, *UC Berkeley manuscript*, 2009.

5.5. Peer Reviewed Conference Papers

- L. Mihailescu, B. Fishbain, D.S. Hochbaum, J. Maltz, C.J. Moore, J. Rohel, L. Supic, K. Vetter, “Dynamic stand-off 3D gamma-ray imaging”, *12th Symposium on Radiation Measurements and Applications (SORMA) 2010*, University of Michigan - Ann Arbor, USA, 24-27 May 2010.
- B. Fishbain, I. Ideses, D. Mahalel, L. Yaroslavsky, “Real-Time Vision-Based Traffic Flow Measurements and Incident Detection”, *Proc. Real-time Image and Video Processing/Electronic Imaging 2009*, SPIE Vol. 7244, San-Jose, CA, USA, 18-22 January 2009.

- I. Ideses, B. Fishbain, L. Yaroslavsky, “Real-Time Depth Map Manipulation for 3D Visualization”, *Proc. Real-time Image and Video Processing/Electronic Imaging 2009*, SPIE Vol. 7244, San-Jose, CA, USA, 18-22 January 2009.
- 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 Vol. 7245A, San-Jose, CA, USA, 18-22 January 2009.
- Ianir A. Ideses, Barak Fishbain, Leonid P. Yaroslavsky, "Depth Map Manipulation for 3D Visualization", *Proc. IEEE 3DTV Conference*, Istanbul Turkey, 28-30 May 2008.
- Barak Fishbain, Leonid P. Yaroslavsky, Ianir A. Ideses, “Real Time Turbulent Video Super-Resolution Using MPEG 4”, *Proc. of Real-Time Image Processing/Electronic Imaging 2008*, SPIE Vol. 6811, pp. 6-9, San-Jose, CA, USA, 28 January - 1 February 2008.
- Barak Fishbain, Leonid P. Yaroslavsky, Ianir A. Ideses, Frederique Roffet-Crete, "No-Reference Method for Image Effective Bandwidth Estimation", *Proc. of Image Quality and System Performance V/Electronic Imaging 2008*, SPIE Vol. 6808, San-Jose, CA, USA, 28 January - 1 February 2008.
- Leonid P. Yaroslavsky, Gil Shabat, Barak Fishbain, Ianir A. Ideses, "Super-Resolution of Turbulent Video: Potentials and Limitations", *Proc. of Image Processing: Algorithms and Systems VI/Electronic Imaging 2008*, SPIE Vol. 6812, pp. 5-13, San-Jose, CA, USA, 28 January - 1 February 2008.
- Leonid P. Yaroslavsky, Alex Agranovich, Barak Fishbain, Ianir A. Ideses, "Precise differentiation can significantly improve the accuracy of optical flow measurements", *Proc. of Image Processing: Algorithms and Systems VI/Electronic Imaging 2008*, SPIE Vol. 6812, pp. 11-19, San-Jose, CA, USA, 28 January - 1 February 2008.
- Ianir A. Ideses, Barak Fishbain, Leonid P. Yaroslavsky, "Depth Maps: Faster, Higher and Stronger?", *Proc. of Three-Dimensional Image Capture and Applications/Electronic Imaging 2008*, SPIE Vol. 6805, pp. 1-11, San-Jose, CA, USA, 28 January - 1 February 2008.
- Barak Fishbain, Leonid P. Yaroslavsky, Ianir A. Ideses, “Real Time Turbulent Video Perfecting by Image Stabilization and Super-resolution”, *Proc. Of the 7th IASTED International Conference on Visualization, Imaging, and Image Processing (VIIP 2007)*, pp. 213-218, Palma de Mallorca Spain, 29-31/8/2007.
- Ianir A. Ideses, Leonid P. Yaroslavsky, Itai Amit, Barak Fishbain, “Depth map Quantization how much is Sufficient?”, *Proc of 3DTV-Conference, Capture, Transmission and Display of 3D Video*, pp. 1-4, Kos Island, Greece, 7-9/5/2007.
- Barak Fishbain, Ianir A. Ideses, Shai Gepstein and Leonid P. Yaroslavsky, Turbulent video enhancement: Image stabilization and super-resolution, *The 11th Meeting on Optical Engineering and Science in Israel*, Tel-Aviv, Israel, 26-27/3/2007.
- Ofer Shapira, Danny Ravid, Barak Fishbain, Ianir A. Ideses, Leonid P. Yaroslavsky, Zadok Hadas, “Turbulent Compensation Implementation for Embedded Systems”,

The 11th. Meeting on Optical Engineering and Science in Israel, Tel-Aviv, Israel, 26-27/3/2007.

- Ianir A. Ideses, Leonid P. Yaroslavsky, Roni Vistuch and Barak Fishbain, “3D video from compressed 2D video”, *Proc. of Stereoscopic Displays and Applications XVIII*, SPIE Vol. 6490, pp. 28-35, San-Jose, CA, USA, 28 January - 1 February 2007.
- Barak Fishbain, Leonid P. Yaroslavsky, Ianir A. Ideses, Alon Shtern, Ofer Ben-Zvi, “Real-time stabilization of long-range observation system turbulent video”, *Proc. of Real-Time Image Processing/Electronic Imaging 2007*, SPIE Vol. 6496, pp. 12-22, San-Jose, CA, USA, 28 January - 1 February 2007.
- Leonid P. Yaroslavsky, Ianir A. Ideses, Barak Fishbain, Roni Vistuch, Lenny Ridel, “3D Video from 2d MPEG streams, Methods and applications”, *ICO Topical Meeting on, Optoinformatics*, pp. 136-137, Saint-Petersburg, Russia, 4-7 September 2006.
- Leonid P. Yaroslavsky, Barak Fishbain, Ianir Ideses, Dan Slasky, Zadok Hadas, “Simple methods for real time stabilization of turbulent video”, *ICO Topical Meeting on, Optoinformatics*, pp. 138-140, Saint-Petersburg, Russia, 4-7 September 2006.
- Shai Gepshtein, Alex Shtainman, Barak Fishbain, Leonid P. Yaroslavsky, “Restoration of atmospheric turbulent video containing real motion using elastic image registration”, *Proc. of the 2004 European Signal Processing Conference (EUSIPCO-2004)*, pp. 477-480, Vienna, Austria, September 6-10, 2004.
- Leonid Yaroslavsky, Barak Fishbain, Alex Shteinman, Shai Gepshtein, “Processing and Fusion of Thermal and Video Sequences for Terrestrial Long Range Observation Systems”, *Proc. of the 7th International Conference on Information Fusion*, pp. 848-855, Stockholm, Sweden, June 2004.