Yitzhak August

Curriculum Vitae

Ben-Gurion University of the Negev
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Academic education

2011–present **Ph.D. student in Electro-Optical Engineering**, *Ben-Gurion University of the Negev, The faculty of engineering.*
Thesis title:
Developing methods for hyperspectral imaging based on optical compressing sensing techniques .
Project advisor : Prof. Dan G. Blumberg, Prof. Adrian Stern and Prof. Stanley R. Rotman.

2007–2010 **M.Sc Degrees in Electro-Optical Engineering (*Summa cum laude*)**, *Ben-Gurion University of the Negev, The faculty of engineering.*
Thesis title:
Identifying persistent scatterers in the process of radar interferometry.
Project advisor : Prof. Dan G. Blumberg and Prof. Stanley R. Rotman.

2006–2007 **B.Sc Courses in Electrical and Computer Engineering**, *Ben-Gurion University of the Negev, The faculty of engineering.*

2002–2006 **B.Sc Degrees in Theoretical physics**, *Ben-Gurion University of the Negev, The faculty of natural sciences.*

Ph.D Research interests - Optical compressive sensing

- My Ph.D main research interest is in the fields of hyperpsectral compressive sensing imaging ; we are working on developing a new architecture and method for spatial and spectral sampling and measurement by using physical elements from the class of tunable dielectric thin-film filter to compose spectrometers and spectroscopic imaging systems, in a way that complies efficiently with the new mathematical theory of compressive sensing.

- BGU-CubeSat is a student nano-satellite project. The nano-satellite project team has members from different Engineering departments of Ben-Gurion University. The satellite project is coordinated by department of mechanical engineering. The mission of the BGU-CubeSat nano-satellite is to Image the earth with hyperspectral capabilities for remote sensing application. The heart of the BGU-CubeSat system is a new micro sensor that is developing based on our theoretical research of compressive sensing hyperspectral way of imaging. A few examples for space micro sensor elements are based on the modified tunable Fabry–Pérot cell with an optical detector, the liquid crystal tunable retarder with optical detector array, birefringent elements cell, tunable thin film filter and others.

M.Sc Research - Permanent Scatter interferometry

- My M.Sc main research of interest was in the field of satellite multi-temporal differential synthetic aperture radar interferometry. The use of this kind of multi-temporal differential interferometery has many application, some applied to study single deformation episodes, such as earthquakes and volcanic events. In my M.Sc research we focus on develop algorithm to identify permanent scatter candidates for coherent permanent scatter interferometry (PSInSAR) process. Our method is based on iterative principle component analysis (PCA) and the amplitude time history signature of each voxel. The application of the PSC selection process was done in natural regions as opposed to the main use of the PS technique, where most of the work is done in populated and urban areas which contain strong reflection structures (manmade objects).

- Recently we have implemented the algorithm of identify permanent scatter candidates based on radar satellite TerraSAR-X images covering the area around Sendai (Japan). This work may support Future research on the Sendai Earthquake event on $2011-03-11$. The works is based on acquire co-seismic data and a post-seismic time series covering the area around Sendai (Japan) in ascending and descending orbits.

Journal publications

1 **Y. Cohen, Y. August, D. G. Blumberg and S. R. Rotman**, *"Novel concepts for finding the best hyperspectral detection for algorithm"*, **Journal of Electrical and Computer Engineering**, *Volume 2012 (2012), Article ID 103286, 15 pages doi:10.1155/2012/103286.*

2 **Y. August, C. Vachman, Y.Rivenson and A.Stern**, *"Compressive hyperspectral imaging by random separable projections in both spatial and spectral domains"*, Applied Optics, *Vol. 52, Issue 10, pp. D46-D54 (2013).*

3 **V. Farber, Y. August and A. Stern**, *"Data acquisition by integration of super-resolution and compressed sensing principles"*, *Optics Express*, *Vol. 21 Issue 22, pp.25851-25863 (2013).*

4 **Y.August and A. Stern**, *"Compressive sensing spectrometry based on liquid crystal devices"*, Optics Letters, **accepted 10/28/2013;Doc. ID 194484**.

5 **D. G. Blumberg, Y. August, R. Aviram and S. R. Rotman**, *"SAR coherence for assessing aeolian geomorphic stability and motion: The Negev-Sinai dunes case"*, Remote Sensing of Environment, **Submitted**.

6 **A. Stern, Y. Rivenson and Y. August**, *"Optical compressive sensing: challenges, some solutions and open questions"*, Sampl. Theory Signal Image Process, **Submitted**.

Conference proceedings publications

1 **Y. August, R. Aviram, D. G. Blumberg, and S.R. Rotman**, *"Interferogram creation process and extracting environmental information from the decorrelation data"*, 7^{th} *Conference on Active Research by Environmental Science Students (CARESS)*, Weizmann Institute of Science, Israel.
June, 2009

2 **Y. August, D. G. Blumberg, and S.R. Rotman**, *"Subpixel high accuracy image registration for radar interferometry processes"*, *International Society for Photogrammetry and Remote Sensing (ISPRS) joint workshop ISPRS Archive Vol. XXXVIII, Part 4-8-2-W9*, University of Haifa, Israel.
March, 2010

3 **Y. August, D. G. Blumberg, and S.R. Rotman**, *"Identifying Persistent Scatterers in open and natural areas"*, *The* 5^{th} *International Workshop on Science and Applications of SAR Polarimetry and Polarimetric Interferometry (POLinSAR) The European Space Agency (ESA) Special Publication SP-695*, ESRIN, Frascati, Italy.
January, 2011

4 **D. G. Blumberg, Y. August, and S.R. Rotman**, *"Assessing dune stability and motion using SAR coherence; a case study with land-use land-change drivers"*, 31^{th} *European Association of Remote Sensing Laboratories Symposium (EARSeL)*, Czech Technical University in Prague, Czech Republic.
April, 2011

5 **Y. August, D. G. Blumberg, and S.R. Rotman**, *"Identifying persistent scatterers for ground deformation mapping in open areas"*, 8^{th} *Conference on Active Research by Environmental Science Students (CARESS)*, Weizmann Institute of Science, Israel.
June 2011

6 **Y. August, D. G. Blumberg, and S.R. Rotman**, *"Identifying low reflection amplitude and low level phase noise points for permanent scatterer (PS) interferometry*, *The* 3^{rd} *International IEEE Conference on Microwaves, Communications, Antennas and Electronic Systems (IEEE COMCAS & IEEE Xplore.)*, Tel-Aviv, Israel.
November, 2011

7 **D. G. Blumberg, Y. August, and S.R. Rotman**, *"Radar observations of planetary dune analogues and assessing their stability using synthetic aperture radar*, *Third International Planetary Dunes Workshop*, Flagstaff, Arizona, USA.
June, 2012

8 **D. G. Blumberg, Y. August, and S.R. Rotman**, *"Radar observation of Venus terrestrial analogues using TecSAR X-band SAR*, *The European Geosciences Union General Assembly (EGU)*, Vienna, Austria.
April, 2012

9 **D. G. Blumberg, Y. August, and S.R. Rotman**, *"Measuring geomorphic stability and mobility Interferomteric coherence data as an indicator for aeolian (wind-blown) dune stability*, *The European Geosciences Union General Assembly (EGU)*, Vienna, Austria.
April, 2012

10 **Y. August, C. Vachman and A. Stern**, *"Spatial versus spectral compression ratio in compressive sensing of hyperspectral imaging"*, *Defense, Security, and Sensing 2013 | SPIE*, Baltimore, Maryland, United States.
May, 2013

11 **A. Stern, Y. Rivenson and Y. August**, *"Challenges in Optical Compressive Imaging and Some Solutions"****(Invited)***, 10^{th} *International Conference on Sampling Theory and Applications*, Jacobs University Bremen, Germany.
July, 2013

12 **A. Stern, Y. AugustY, Rivenson, V. Farber, and Y. Oiknine**, *"Hyperspectral Compressive Imaging"****(Invited)***, *WIO - 12th Workshop on Information Optics*, Canary Islands - Spain - Tenerife.
July, 2013

13 **A. Shalev, A. Yagev, Y. August, D. G. Blumberg, and S. R. Rotman**, *"Persistent Scatterers Detection In Open Area In High Resolution SAR Imagery - Case Study: Sendai, Japan 2011"*, *The International IEEE Conference on Microwaves, Communications, Antennas and Electronic Systems (IEEE COMCAS & IEEE Xplore.)*, Tel-Aviv, Israel.
October, 2013

14 **A. Stern, Y. August, Y. Oiknine**, *"A comparison between three compressive hyperspectral sensing methods"*, To be present in *SPIE Sensing Technology + Applications, Compressive Sensing III*, Baltimore, Maryland, United States.
May, 2014

Teaching experience

2011–Present **Electro-Optics teaching laboratory - Graduate degree course**, *Ben-Gurion University of the Negev, Electro-Optics Engineering Unit*, Beer-Sheva.

2009–2011 **Teacher of remote sensing and space**, *Makif Gimmel high school.*

2008–2009 **Teacher of meteorology**, *Makif Gimmel high school.*

2006–2008 **Teacher of physics**, *Zinman high school.*

2006–2007 **Substitute sciences teacher**, *Makif Gimmel high school.*

2006–2008 **Teacher of physics course**, *Informal science education, Sciences center.*

Academic activities and leadership

2012–present **Chapter Officers of The Optical Society (OSA) and The international society for optics and photonics (SPIE) BGU student chapters**.

2012–present **Student memeber in SPIE, OSA and IEEE**.

Book and article review

2012–present **Reviewer for Optics Letters (OSA), Optics Express (OSA)** & **Optical Engineering (SPIE) journals**.

2010 **THE SAGE HANDBOOK OF REMOTE SENSING, by Timothy A. Warner, M.Duane Nellis and Giles M. Foody**, London: Sage Publications, 2009, Geography Research Forum.