Aviad Levis

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Education

2014-2019	Ph.D. (direct track), Viterbi Faculty of Electrical Engineering, Technion - Israel Institute of Technology, Israel. Thesis: *Volumetric Imaging of the Natural Environment*; Supervisor: Prof. Yoav Schechner.
2009-2013	B.Sc. in Electrical Engineering, *Cum Laude*. Ben-Gurion University, Israel.

Employment and Internships

2020-present	Postdoctoral scholar at the Computing & Mathematical Sciences, Caltech. Imaging of black holes. Part of the *Event Horizon Telescope Collaboration*.
2018	Research internship at Google Research, Perception team. Artificial intelligence for audio-visual signal analysis.
2014	Research internship at the Jet Propulsion Laboratory (NASA-Caltech). Three-dimensional remote sensing of the atmosphere.

Selected Accomplishments, Honors, and Awards

2020/2022	Technion Viterbi postdoctoral fellowship for nurturing future faculty members.
2020	Zuckerman STEM leadership program postdoctoral fellowship.
2019	Young scientist participant in the 69th Lindau Nobel Laureate Meeting.
2019	CloudCT: a space mission derived from my Ph.D. research, won ERC funding (€14 Million).
2018	International Space Science Institute (ISSI) Team - Invited Young Scientist.
2017/2018	Jacobs-Qualcomm fellowship for academic achievement of Ph.D. students.
2017	Jury award for distinguished graduate students.
2015	Jacobs fellowship for academic achievement of M.Sc. students.

Teaching

2022	**Organizer**; Invited Tutorial at CVPR22: "Computational Imaging for Science".
2020-2022	**Guest lecture**; Computational Imaging course, CMS Dept., Caltech.
2020-2021	**Mentor**; Summer Undergraduate Research Fellowships (SURF), Caltech.
2014-2019	**Supervisor**; Undergraduate projects, EE Dept., Technion.
2014-2016	**Teaching assistant**; Courses: Image Processing; Signals and Systems, EE Dept., Technion.

Academic Service

2022	Local Arrangement Chair: International Conference on Computational Photography.
2021	Program committee IEEE International Workshop on Computational Cameras and Displays.
2021	Graduate admission committee, CMS department, Caltech.
2020	Program committee IEEE ICCP, 2021.
2020	EE systems seminars committee, Caltech.
2020	Science organizing committee, 3rd imaging workshop, EHT collaboration.
2019	Organizer, CloudCT workshop, Technion, Israel.
2014-present	Reviewer: CVPR, ECCV, ICCP, Optics Express, ICIP, IEEE Trans Comp Imaging, Journal of Inverse Problems, JSQRT (Elsevier), MDPI Remote Sensing.

PUBLICATIONS

Peer Reviewed Publications[1]

1. J. Loveridge, **A. Levis**, L. Di Girolamo, V Holodovsky, L. Forster, A. B. Davis and Y. Y. Schechner, *Retrieving 3D distributions of atmospheric particles using Atmospheric Tomography with 3D Radiative Transfer – Part 2: Retrieval Accuracy.*, Atmos. Meas. Tech., In Preperation

2. J. Loveridge, **A. Levis**, L. Di Girolamo, V Holodovsky, L. Forster, A. B. Davis and Y. Y. Schechner, *Retrieving 3D distributions of atmospheric particles using Atmospheric Tomography with 3D Radiative Transfer – Part 1: Model description and Jacobian calculation.*, Atmos. Meas. Tech., 2022.

3. **A. Levis**, P. Srinivasan, A. Chael, R. Ng, and K. L. Bouman, *Gravitationally Lensed Black Hole Emission Tomography*, Proc. IEEE CVPR, 2022.

4. **A. Levis**, D. Lee, J. A. Tropp, C. F. Gammie, and K. L. Bouman, *Inference of Black Hole Fluid-Dynamics from Sparse Interferometric Measurements*, Proc. IEEE ICCV, 2021.

5. **A. Levis**, Y. Y. Schechner, A. B. Davis, and J. Loveridge, *Multi-View Polarimetric Scattering Cloud Tomography and Retrieval of Droplet Size*, Remote Sensing, 2020.

6. T. Loeub, **A. Levis**, V Holodovsky and Y. Y. Schechner, *Monotonicity Prior for Cloud Tomography*, European Conference on Computer Vision (ECCV), 2020.

7. A. Aides, **A. Levis**, V Holodovsky, Y. Y. Schechner, D. Althausen, and A. Vainiger *Distributed Sky Imaging Radiometry and Tomography*, Proc. IEEE ICCP, 2020.

8. F. A. Mejia, B. Kurtz, **A. Levis**, Í Parra and J. Kleissl *Cloud Tomography Applied to Sky Images: A Virtual Testbed*, Solar Energy, 2018.

9. **A. Levis**, Y. Y. Schechner and R. Talmon, *Statistical Tomography of Microscopic Life*, Proc. IEEE CVPR, 2018.

10. **A. Levis**, Y. Y. Schechner and A. B. Davis, *Multiple-Scattering Microphysics Tomography*, Proc. IEEE CVPR, 2017.

11. V. Holodovsky, Y. Y. Schechner, A. Levin, **A. Levis** and A. Aides, *In-Situ Multi-View Multi-Scattering Stochastic Tomography*, Proc. IEEE ICCP, 2016.

12. **A. Levis**, Y. Y. Schechner, A. Aides and A. B. Davis, *Airborne Three-Dimensional Cloud Tomography*, Proc. IEEE ICCV, 2015. **- Oral presentation (3.3% acceptance)**.

13. D. Veikherman, A. Aides, Y. Y. Schechner and **A. Levis**, *Clouds in The Cloud*, Proc. ACCV, 2014.

Highlighted EHT Collaboration Publications

14. The Event Horizon Collaboration et al. *First Sagittarius A* Event Horizon Telescope Results. III. Imaging of the Galactic Center Supermassive Black Hole*, ApJ, 2022.

15. The Event Horizon Collaboration et al. *First Sagittarius A* Event Horizon Telescope Results. IV. Variability, Morphology, and Black Hole Mass*, ApJ, 2022.

Other Publications

16. **A. Levis**, Invited Article, *Computational Imaging Sheds Light on the Black Hole in our Galactic Center*, SIAM News, Nov 2022 issue.

Invited Talks at International Conferences

17. *Next Generation Event Horizon Telescope Imaging*, Biomedical and Astronomical Signal Processing (BASP) Frontiers, to be given in 2023.

18. *Computational Imaging of Black Holes*, Grundfest Memorial Lecture Series, UCLA-Caltech, to be given in 2022.

19. *Imaging Fluid-Dynamics by Stochastic Model Fitting*, Electronic Imaging, 2021.

20. *Statistical tomography of microscopic life*, CVPR Workshop on Automated Analysis of Marine Video for Environmental Monitoring, 2018.

21. *Inverse-scattering Bridging Micron to Kilometer Scales*, CVPR Workshop on Computational Cameras and Displays, Hawaii, USA, 2017.

22. *Remote Sensing of 3D Cloud Microphysics via Radiative Transfer*, JpGU-AGU, Japan, 2017.

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[1]In major competitive computer vision conferences, full-length papers undergo a rigorous double-blind review process (the authors are anonymous at submission). Acceptance is typically tougher than in journals, particularly for Oral presentation. Acceptance ratios in recent (2015) CVPR and ICCV conferences were: Orals:3% Posters:23% In 2022 CVPR is ranked number 4 in H-5 index ranking across **all** scientific disciplines.

23. *Three-Dimensional Microphysical Tomography of Clouds*, The 16th Electromagnetic and Light Scattering Conference, Maryland, USA, 2017.

Other Conference Publications

24. **A. Levis**, A. B. Davis, J. Loveridge, Y. Y. Schechner, Y. Sde-Chen, R. Ronen, V. Holodovsky, E. Eytan, I. Koren and O. Altaratz *3D cloud microphysical tomography using overhead multi-view imaging polarimeters: From physics-based retrievals to machine-learning algorithms*, Advancement of POLarimetric Observations (APOLO), 2022.

25. **A. Levis**, A. B. Davis, J. Loveridge, Y. Y. Schechner *3D Cloud Tomography and Droplet size Retrieval from Multi-Angle Polarimetric Imaging of Scattered Sunlight from Above*, Proc. SPIE, Polarization Science and Remote Sensing X, 2021.

26. **A. Levis**, Y. Y. Schechner, A. B. Davis, J. Loveridge *Droplet Size Tomography Using Multi-View Polarimetric Measurements*, AGU Fall Meeting, 2020.

27. L. Forster, Y. Kölling, V. Pörtge, T. Zinner, B. C. Mayer, **A. Levis**, J. R. Loveridge, A. B. Davis *3D cloud tomography during EUREC4A: Synergy of MISR multi-angle satellite imaging and airborne remote sensing onboard HALO*, AGU Fall Meeting, 2020.

28. **A. Levis**, V. Holodovsky, Y. Y. Schechner, E. Eytan, I. Koren, A. Aumann, K. Schilling *CloudCT: Spaceborne scattering tomography by a large formation of small satellites for improving climate*, COSPAR Symposium, Israel, 2019.

29. V. Holodovsky, M. Fisher, Y. Y. Schechner, D. Rosenfeld, **A. Levis** *Geometric aspects of stereoscopic spaceborne imaging of dynamic clouds in the CLOUD experiment*, COSPAR Symposium, Israel, 2019.

30. D. Rosenfeld, C. Cornet, S. Aviad, P. Crebassol, P. Dandini, E. Defer, C. Fallet, V. Holodovsky, **A. Levis**, A. Kaidar, C. Price, D. Ricard, Y. Schechner, P. Tabary, Y. Yair C^3IEL *: Cluster for Climate and Cloud Imaging of Evolution and Lightning, an innovative way to observe clouds and their environment*, COSPAR Symposium, Israel, 2019.

31. A. B. Davis, F Xu, G. V. Harten, D. J. Diner, **A. Levis**, Y. Y. Schechner, G. Matheou, *Inherent Properties of Clouds in the PBL Derived from Multi-angle Spectro-Polarimetric Imaging at the "Edge of Space:" New Capabilities of JPL's AirMSPI Sensor on NASA's Airborne ER-2 Platform*, AGU Fall Meeting, San Fransico, 2019.

32. **A. Levis**, Y. Y. Schechner, R. Talmon, *Statistical Tomography of Microscopic Life*, Proc. IEEE ICCP - Int. Conference on Computational Photography, USA, 2018.

33. **A. Levis**, Y. Y. Schechner, R. Talmon, *In-situ Tomography of Plankton*, MOST Workshop on Exploring Translucent Media, 2018.

34. **A. Levis**, Y. Y. Schechner, A. Aides, A. B. Davis, *3D Cloud Tomography via Solar Radiative Transfer*, International Radiation Symposium, New Zealand, 2016.

35. **A. Levis**, Y. Y. Schechner, A. Aides, A. B. Davis, *3D Cloud Tomography using Solar Radiative Transfer*, Atmospheric Radiation Science Workshop, Colorado, 2016.

36. **A. Levis**, Y. Y. Schechner, A. Aides, *Three-Dimensional Cloud Tomography*, Vision Day, Israel, 2016.

37. V. Holodovsky, **A. Levis**, Y. Y. Schechner, A. Levin, A. Aides, A. B. Davis, *3D Multi-Scattering Tomography*, Int. Conf. Computational Photography, Illinois, 2016.

38. **A. Levis**, Y. Y. Schechner, A. Aides, A. B. Davis, *Airborne Three-Dimensional Cloud Tomography*, Israeli Machine Vision Conference, Israel, 2016.

39. D. Rosenfeld, **A. Levis**, I. Bibi, Y. Y. Schechner, A. Rosenfeld, D. Fischer, J. Woytach, *Globe Imaging of 3D Motion: Microphysics to centuries of change*, ICCV Workshop, Chile, 2015.

40. **A. Levis**, A. Aides, V. Holodovsky, Y. Y. Schechner, A. Levin, A. B. Davis, *Efficient 3D Atmospheric Tomography of Scatter Distribution*, AGU-GAC-MAC-CGU Joint Assembly, Canada, 2015.

41. A. Aides, D. Veikherman, **A. Levis**, Y. Y. Schechner *Ground-Based Multi-Angle Imaging Network for 3D Atmospheric Sensing*, AGU-GAC-MAC-CGU Joint Assembly, Canada, 2015.

42. D. Veikherman, A. Aides, Y. Y. Schechner, **A. Levis**, Clouds in The Cloud, Israel Computer Vision Day, Israel, 2016.