

Tali Treibitz

Curriculum Vitae

Personal Details

Name: Tali Treibitz
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Research Interests

Imaging, Underwater Sensing, Computer Vision, Computational Photography, Oceanic Engineering

Academic Degrees

2004 to 2010 Ph.D. in Electrical Engineering (Technion, Israel).
1998 to 2001 B.A. in Computer Science summa cum laude (Technion, Israel).

Awards and Honors

- University National Oceanographic Laboratory System (UNOLS) Chief Scientist Early-Career Training Cruise, fully funded fellowship for the 7-day cruise and pre-cruise training (2013).
- European Conference for Computer Vision 2012 Outstanding Reviewer Award.
- Awardee of the Weizmann Institute of Science – National Postdoctoral Award Program for Advancing Women in Science, 2010.
- Ollendorf Fellow, 2009.
- Google Europe Anita Borg Scholarship Recipient, 2009.
- Google Europe Anita Borg Scholarship Finalist, 2008.
- HP Fellow, 2008.
- Technion Excellence Program, Fellow, 1998-2001.
(1.7% of Technion students, monthly stipend and exemption from tuition)
- Excellence Awards from the President of the Technion, 4 times, 1998-2000.
- Technion CS Faculty Excellence Award for overall achievements, 2000.

Academic Appointments

2014 to Present	Senior Lecturer, Marine Technologies Dept., School of Marine Sciences, U. of Haifa
2011 to 2013	Post Doctoral Researcher, Marine Physical Lab, Scripps Inst. of Oceanography, San Diego
2010 to 2013	Post Doctoral Researcher, Computer Science and Engineering Dept., UCSD
2007	Intern, Deep Submergence Laboratory, Woods Hole Oceanographic Institution.
2004 to 2009	Teaching Assistant, Department of Electrical Engineering, Technion.
2006 to 2009	Undergraduate Project Supervisor, Department of Electrical Engineering, Technion.
2001	Teaching assistant, Department of Computer Science, Technion.

Awarded Grants

2015, Israeli Ministry of National Infrastructures, Energy, and Water Resources, "Development of an underwater imaging system for microscopic particles", 3 years, 45000\$, PI.

2015, Schulich Equipment Grant, Custom *in situ* microscope, 15000\$, PI

2016, German-Israeli Foundation for Scientific Research and Development, "Developing an Underwater Imaging System for Micropollution", 20000€, PI

2016, Ministry of Science, Technology and Space, "Developing new methodologies for quantifying biological sediment resuspension in the sea and for studying its dynamics", 2000000NIS, PI

2016, Ministry of Science, Technology and Space, "Our Eyes Beneath The Sea a Holistic AUV Based Framework for Visual Seafloor Surveys", 2400000 NIS, Lead PI

2017, Israel Innovation Authority , "Improving Visibility in Underwater Images", 400000 NIS, Lead PI

2017-2019, European Unions Horizon 2020 research and innovation programme , "SYMBIOSIS- A Holistic Opto-Acoustic System for Monitoring Marine Biodiversities", Co-PI

Graduate Students

2017 to present	Mr. Matan Yuval, towards M.Sc.
2017 to present	Mr. Eden Sassoon, towards M.Sc.
2016 to present	Mr. Yuval Goldfracht, towards M.Sc.
2015 to 2017	Mr. Ori Spier, M.Sc.
2015 to 2017	Miss. Dana Berman, Ph.D.
2014 to 2017	Miss. Adi Zweifler, M.Sc.
2014 to present	Mr. Dotan Shreiber, towards M.Sc.
2012 to 2013	Mr. Zachary Murez, towards M.Sc. Co-Advised with David Kriegman.
2012	Mr. Srdjan Krstic, M.Sc. project "Distance from Defocus", Co-Advised with David Kriegman.

Other Professional Experience

- 2003 to Present Active PADI diving instructor.
- 2003 to 2004 Software Engineer (part time), IBM Haifa Research Center, Israel.
★ Developed software in Java, CSharp for a bio-informatics software.
- 2001 to 2002 Software Engineer, Charlotte's Web Networks, Israel.
★ Developed software in an embedded environment, in C/C++.
★ Developed a novel algorithm finding rule conflicts in the network processor.
- 1995 to 1998 Officer, IDF.
★ Conducted and organized training courses.

Research Deployments

- University National Oceanographic Laboratory System (UNOLS) Chief Scientist Early-Career Training Cruise, fully funded fellowship for the 7-day cruise and pre-cruise training (October 2013).
- Gump South Pacific Research Station, Moorea, French Polynesia, April 2011 & April 2012
- Smithsonian Tropical Research Institute, Bocas Del Toro, Panama, September 2011
- Waitt Foundation Research Boat, Totoya Reef, Fiji, June 2011

Press Coverage

2016, Press about our Benthic Underwater Microscope, links gathered here:

<http://jaffeweb.ucsd.edu/2016/07/benthic-underwater-microscope-work-published-in-nature-communications/>

2013, University National Oceanographic Laboratory System (UNOLS) Chief Scientist Early-Career Training Cruise Blog, <http://csw.unols.org/2013/10/we-have-diatoms/>

2013, Scripps Ocean Explorations article,

<http://explorations.ucsd.edu/research-highlights/2013/five-new-instruments-keeping-oceanography-fun>

2013, GreenWire article, <http://www.eenews.net/greenwire/stories/1059986651/>

2012, American Museum of Natural History Science Bulletin

[http://www.amnh.org/explore/science-bulletins/\(watch\)/bio/snapshots/underwater-microscope-zooms-in-on-tiny-marine-life](http://www.amnh.org/explore/science-bulletins/(watch)/bio/snapshots/underwater-microscope-zooms-in-on-tiny-marine-life)

2012, Cover image, International Coral Reef Symposium (ICRS 2012)

<http://www.icrs2012.com/NewsCoral2012/21st-Announcement.htm>

2011, National Geographic News Watch

<http://newswatch.nationalgeographic.com/tag/tali-treibitz-and-greg-mitchell>.

2009, Technion newspaper, "Seeing Clearly,"

http://vision.ucsd.edu/~tali/webfiles/EE_story_2007.pdf.

Public Professional Activities

- Associate editor, Journal of Visual Communication and Image Representation.
- Organizing committee, Marine Imaging Workshop 2017.
- Web and Publicity Chair, IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2016.
- Marine Technology Society, member.
- Oceans'13 MTS/IEEE San Diego "Imaging and Vision" Session Chair.

- **Reviewer for:** J. of Oceanographic Engineering; Applied Optics; IEEE Transactions on Pattern Analysis and Machine Intelligence; IEEE International Conferences on Computer Vision (ICCV); IEEE Conference on Computer Vision and Pattern Recognition (CVPR); European Conference on Computer Vision (ECCV); J. of Visual Communication and Image Representation; ACM SIGGRAPH conference on Computer Graphics Asia.
- ★ ECCV 2012 **Outstanding Reviewer Award**.

Teaching Experience

- 2015 - 2016 Lecturer, Dept. of Electrical Engineering, Technion, "Applications and Algorithms in Computer Vision"
- 2004 to 2009 Teaching Assistant, Dept. of Electrical Engineering, Technion, in the following courses:
- Biological Signals and Systems
 - Visual and Auditory Systems
 - Image Processing
 - Imaging Systems for Computer Vision
 - Analysis and recognition in Images and Video
- 2006 to 2009 Undergraduate Project Supervisor, Dept. of Electrical Engineering, Technion.
- List of projects:
- Automatic Red-Eye Removal, Signal and Image Processing Lab
 - Underwater Computer Vision Camera, Computer Graphics and Multimedia Lab (CGM)
 - A New Algorithm for Unsupervised Global and Local Color Correction, CGM
 - Bad Visibility Image Enhancement Using Visual Servo, Vision and Image Science Lab (VISL)
 - Cleaning Marine Snow in Underwater Videos, VISL
 - Detection and Classification of Lesions in Leaves, VISL
 - Image Enhancement in Scattering Media Based on the Human Visual System, VISL
 - Fast Separation of Direct and Global Illumination, VISL
 - Backscatter Removal from Single Underwater Images, VISL
- 2001 Teaching Assistant, Dept. of Computer Science, Technion, in the course
- Introduction to Computer Science

Extra-curricular Activities

- 2006-2009 A representative of the EE department in the Graduate Students Organization.
- 2008-2009 A representative of the EE department in the Teaching Staff Organization.
- 2003 to Present Active PADI diving instructor.

Peer Reviewed Publications

★ The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), International Conference for Computer Vision (ICCV), and European Conference for Computer Vision (ECCV) are major competitive computer vision conferences, in which full-length papers undergo a rigorous double-blind review process (the authors and reviewers are anonymous throughout the review process). Acceptance is typically tougher than in journals. Acceptance rate is typically around 22%, with 4% for orals.

1. D. Levy, Y. Belfer, E. Osherov, E. Bigal, A. P. Scheinin, H. Nativ, D. Tchernov, **T. Treibitz**, “*Automated Analysis of Marine Video With Limited Data*,” CVPR 2018, Workshop on Automated Analysis of Marine Video for Environmental Monitoring
2. D. Akkaynak, **T. Treibitz**, “*A Revised Underwater Image Formation Model*,” IEEE Computer Vision and Pattern Recognition (CVPR) 2018.
3. I. Alonso, A. Cambra, A. Muoz, **T. Treibitz**, A. C. Murillo, “*Coral-Segmentation: Training Dense Labeling Models with Sparse Ground Truth*,” ICCV 2017, first international workshop on Visual Wildlife Monitoring (VWM 2017).
4. A. Zweifler, D. Akkaynak, T. Mass, **T. Treibitz**, “*Analyzing Distribution of Coral Recruits using Fluorescence Imaging*,” *Frontiers in Marine Science*, 2017.
5. Schoening T, Durden J, Preuss I, Branzan Albu A, Purser A, De Smet B, Dominguez-Carrio C, Yesson C, de Jonge D, Lindsay D, Schulz J, Miller K, Beisiegel K, Kuhnz L, Hoeberechts M, Piechaud N, Sharuga S, **Treibitz T**, “*Report on the Marine Imaging Workshop 2017*,” *Research Ideas and Outcomes* 3: e13820, 2017
6. D. Berman, **T. Treibitz**, S. Avidan, “*Diving into Haze-Lines: Color Restoration of Underwater Images*,” *British Machine Vision Conference*, 2017.
7. D. Akkaynak, **T. Treibitz**, T. Shlesinger, R. Tamir, Y. Loya, D. Iluz, “*What Is the Space of Attenuation Coefficients in Underwater Computer Vision?*,” IEEE Computer Vision and Pattern Recognition (CVPR) 2017.
8. O. Spier, **T. Treibitz**, G. Gilboa, “*In Situ Target-Less Calibration of Turbid Media*,” IEEE International Conference Computational Photography, 2017.
9. D. Berman, **T. Treibitz**, S. Avidan, “*Air-Light Estimation Using Haze-Lines*,” IEEE International Conference Computational Photography, 2017.
10. Neal BP, Khen A, **Treibitz T**, Beijbom O, O’Connor G, Coffroth MA, Knowlton N, Kriegman D, Mitchell BG, Kline DI,, “*Caribbean massive corals not recovering from repeated thermal stress events during 2005-2013*,” *Ecology and Evolution*, 7(5), pp.1339-1353, 2017.
11. Z. Murez, **T. Treibitz**, D. Kriegman, Ravi Ramamoorthi, “*Photometric Stereo in a Scattering Medium*,” IEEE Trans. on Pattern Analysis and Machine, 2016.
12. A. D. Mullen*, **T. Treibitz***, P. L. D. Roberts, E. L. A. Kelly, R. Horwitz, J. E. Smith, J. S. Jaffe, “*Underwater Microscopy for In Situ Studies of Benthic Ecosystems*,” *Nature Communications*, vol. 7, 2016.
13. D. Berman, **T. Treibitz**, S. Avidan, “*Non-Local Image Dehazing*,” IEEE Computer Vision and Pattern Recognition (CVPR) 2016, spotlight.
14. O. Beijbom, **T. Treibitz**, D. I. Kline, G. Eyal, A. Khen, B. P. Neal, Y. Loya, B. G. Mitchell, D. Kriegman, “*Improving Automated Annotation of Benthic Survey Images Using Wide-band Fluorescence*,” *Nature Scientific Reports*, 2016.

15. Y. Loya, G. Eyal, **T. Treibitz**, M. P. Lesser, R. Appeldoorn, “*Theme section on mesophotic coral ecosystems: advances in knowledge and future perspectives*,” Coral Reefs, 2016.
16. Z. Murez, **T. Treibitz**, D. Kriegman, Ravi Ramamoorthi, “*Photometric Stereo in a Scattering Medium*,” IEEE International Conference on Computer Vision (ICCV) 2015.
17. B. P. Neal, T. H. Lin, R. N. Winter, **T. Treibitz**, O. Beijbom, D. Kriegman, D. I. Kline, B. G. Mitchell, “*Methods and measurement variance for field estimations of coral colony planar area using underwater photographs and semi-automated image segmentation*,” Environmental Monitoring and Assessment, 187:496, July 2015.
18. O. Beijbom, P. J. Edmunds, T-Y. Fan, C. Roelfsema, J. Smith, M. J. Dunlap, D. I. Kline, V. Moriarty, B. Neal, C-J. Tan, S. Chan, A. Chen, **T. Treibitz**, B. G. Mitchell, D. Kriegman, “*Towards automated annotation of benthic survey images: variability of human experts and operational modes of automation*,” PLOS One, 2015
19. G. Eyal, J. Wiedenmann, M. Grinblat, C. D’Angelo, O. Ben-Zvi, E. Kramarsky-Winter, **T. Treibitz**, Y. Shaked, T. B. Smith, S. Harii, V. Denis, T. Noyes, R. Tamir, Y. Loya, “*Spectral diversity and regulation of coral fluorescence in a mesophotic reef habitat in the Red Sea*,” PLOS One, 2015
20. **T. Treibitz**, B. P. Neal, D. I. Kline, O. Beijbom, P. L. D. Roberts, B. G. Mitchell, D. Kriegman, “*Wide Field-of-View Fluorescence Imaging of Coral Reefs*,” Nature Scientific Reports, 2015.
21. D. Akkaynak, **T. Treibitz**, B. Xiao, U. A. Gurkan, J. J. Allen, U. Demirci, and R. T. Hanlon “*Use of commercial off-the-shelf (COTS) digital cameras for scientific data acquisition and scene-specific color calibration*,” J. Optical Society of America A, Vol. 31, Issue 2, pp. 312-321, 2014.
22. **T. Treibitz**, Z. Murez, B. G. Mitchell, D. Kriegman, “*Shape from Fluorescence*,” European Conference for Computer Vision (ECCV) 2012.
23. **T. Treibitz**, Y. Y. Schechner, “*Turbid Scene Enhancement Using Multi-Directional Illumination Fusion*,” IEEE Trans. on Image Processing, Vol. 21, Issue 11, pp. 4662-4667, 2012.
24. **T. Treibitz**, Y. Y. Schechner, “*Resolution Loss Without Imaging Blur*,” J. Optical Society of America A, Vol. 29, Issue 8, pp. 1516-1528, 2012.
25. F. Schroff*, **T. Treibitz***, S. Belongie, D. Kriegman, “*Pose, Illumination and Expression Invariant Pair-wise Face-Similarity Measure via Doppelganger List Comparison*,” IEEE International Conference on Computer Vision (ICCV) 2011. *Equal contribution.
26. **T. Treibitz**, Y. Y. Schechner, C. Kuntz, H. Singh, “*Flat Refractive Geometry*,” IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. 34, Issue 1, pp. 51-65, 2012.
27. **T. Treibitz**, Y. Y. Schechner, “*Polarization- Beneficial for Visibility Enhancement?*,” oral in IEEE Computer Vision and Pattern Recognition (CVPR) 2009.
28. **T. Treibitz**, Y. Y. Schechner, “*Active Polarization Descattering*,” IEEE Trans. on Pattern Analysis and Machine Intelligence, vol. 31, Issue 3, pages 385-399, 2009.
29. **T. Treibitz**, Y. Y. Schechner, “*Recovery Limits in Pointwise Degradation*,” oral in IEEE International Conference on Computational Photography 2009.
30. **T. Treibitz**, Y. Y. Schechner, H. Singh, “*Flat Refractive Geometry*,” oral in IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2008.
31. **T. Treibitz**, Y. Y. Schechner, “*Instant 3Descatter*,” IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2006.

Thesis

T. Treibitz, Advisor: Dr. Y. Y. Schechner, “*Geometry and Photometry of Imaging Through a Medium*,” Ph.D thesis in Electrical Engineering, Technion (2010).

Book Chapters

T. Treibitz, “*Descattering*,” Computer Vision: A Reference Guide, Ed. Katsushi Ikeuchi, Springer, 2014.

Patents

T. Treibitz, Y. Y. Schechner, “*Imaging system and methods for recovering object visibility*,” US patent 8350957, granted 2013.

O. Spier, T. Treibitz, G. Gilboa, “*In Situ Target-Less Calibration of Turbid Media*,” Provisional submitted, March 2017

D. Berman, T. Treibitz, S. Avidan, “*Image Dehazing and Restoration*,” PCT submitted, April 2017.

Conference Proceedings

T. Treibitz, B. P. Neal, D. I. Kline, O. Beijbom, P. L. D. Roberts, B. G. Mitchell, D. Kriegman, “*Wide Field-of-View Daytime Fluorescence Imaging of Coral Reefs*,” Marine Technological Society / IEEE Oceans, 2013.

Invited Talks

T. Treibitz, “*Shape From Fluorescence*”, *International Congress on Imaging Science*, 2014

Conference Talks

1. T. Treibitz, “*Underwater In Situ Microscopy*,” Extreme Imaging Workshop (ICCV), 2015.
2. T. Treibitz, “*Our Eyes Beneath the Sea: Novel Underwater Imaging Systems*,” Blue Photonics, 2015.
3. T. Treibitz, “*Advanced Optical Methods for Ocean Science*,” The Israeli Association for Aquatic Sciences meeting, 2014.
4. T. Treibitz, B. P. Neal, O. Beijbom, D. Kriegman, S. Belongie, D. I. Kline, B. G. Mitchell, “*Underwater Color as a Source of Scientific Data for Coral Communities*”, American Society of Limnology and Oceanography Aquatic Sciences Meeting, 2011.
5. T. Treibitz, B. P. Neal, P. Roberts, D. I. Kline, O. Beijbom, S. Belongie, B. G. Mitchell, J. Jaffe, D. Kriegman, “*Wide Field of View Full Spectrum Fluorescence Imaging for Coral Ecology*”, International Coral Reef Symposium, 2012.