



Derya AKKAYNAK YELLIN

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EDUCATION AND TRAINING

Middle East Technical University (Turkey)	Aerospace Engineering (1 st in class)	BSc	2003
MIT	Aeronautics & Astronautics	MSc	2005
MIT & Woods Hole Oceanographic Inst.	Mechanical Eng. & Oceanography	PhD	2014

PROFESSIONAL APPOINTMENTS

Smithsonian Tropical Research Institute (Panama)	Short-term fellow	2015
University of Haifa & Interuniversity Institute of Marine Sciences in Eilat (Israel)	Post-doctoral fellow	2015-2018
Princeton University	Post-doctoral fellow	2018-present

EMPLOYMENT HISTORY

Citizen science project www.divers4oceanography.org	Founder	2011-present
National Monitoring Program of Gulf of Aqaba/Eilat, Israel	Software contractor	2018
MIT EdX “User Innovation uINOV8x”	Mentor	2016
Sistine Solar, Inc., Cambridge MA	Software contractor	2015
MIT EdX, “Making Science and Engineering Pictures Work”	Software contractor	2014-2015
MIT ALFA, Cambridge MA	Research contractor	2014-2015
O2 Yoga Studio, Cambridge MA	Clerical assistant	2014-2015
MIT Department of Mathematics	Clerical assistant	2008-2011
Provenir, Inc., Parsippany NJ	Senior IT consultant	2005-2008
MIT-Cambridge Institute Teaching Experiment	Database admin.	2005
MIT Nuclear Engineering Department	Teaching assistant	2003-2004
MIT Mechanical Engineering Department	Teaching assistant	2003-2005
MIT Sloan School of Management	Clerical assistant	2003-2004
Private tutor in math and physics	Independent	1999-2003
Barış Electrical Industries (Turkey)	Intern	2002
Turkish Aerospace Industries	Intern	2001
Aerospace Eng. Dept. at Middle East Technical University	Intern	2000
Air Salvage of Dallas, Lancaster TX	Intern	1999

HONORS AND AWARDS & GRANTS (total to date: \$166,526)

Zuckerman postdoctoral scholarship at the University of Haifa (\$52,000; declined)
Princeton University Nominee for Blavatnik regional post-doctoral competition, 2019
CVPR Women in Computer Vision travel award, 2018 (\$550)
Intl. Ocean Color Coordinating Group Summer Lecture Series travel award (France), 2018 (\$1,918)
University of Haifa Institutional Post-doctoral fellowship (Israel), 2017 & 2018 (\$65,425)
Interuniversity Inst. of Marine Sciences in Eilat (Israel) post-doc scholarship, 2015-2017 (\$36,832)

Smithsonian Tropical Research Institute Short Term Fellowship (Panama), 2015 (\$2,100)
 MIT Department of Mechanical Engineering Martin A. Abkowitz Travel Award, 2014 (\$1,200)
 MIT Public Service Center Grant, 2013 (\$1,500)
 1st place Shell Automated Stratigraphic Interpretation Contest using computer vision, 2012 (\$3,000)
 Woods Hole Oceanographic Institution Coastal Ocean Institute Research Award, 2011 (\$1,500)
 MIT Council for the Arts Grant, 2004 (\$500)
 Graduated 1st in class of Aerospace Engineering at Middle East Technical University, 2003

PEER-REVIEWED PUBLICATIONS & DISSERTATIONS

*The IEEE Conference on Computer Vision and Pattern Recognition ([IEEE CVPR](#)) is the #1 ranking computer vision venue in which full-length papers undergo a rigorous double-blind review process (acceptance rate ~ 22%). The 2017 *citescore* of CVPR was 18.18 (Science: 15.85, Nature 14.59).

2019

1. **Akkaynak D.** & Treibitz T., *Sea-thru: A Method For Removing Water From Underwater Images* [IEEE CVPR*](#) 2019

2. Kahng, S.E., **Akkaynak, D.**, Shlesinger, T., Hochberg, E., Wiedenmann, J., Tamir, R., and Tchernov, D., *Light, Temperature, Photosynthesis, Heterotrophy, and the Lower Depth Limits of Mesophotic Coral Ecosystems*. In Mesophotic Coral Ecosystems, Springer. Editors: Loya, Y., Puglise, K., Bridge, T. pp. 801-828. Springer, Cham, 2019.

3. Neder, M., Laissue, P., Akiva, A., **Akkaynak, D.**, Pinkas, I., & Mass, T. *Mineral Formation in the Primary Polyps of Pocilloporoidea Corals*. In Review

2018

4. **Akkaynak D.** & Treibitz T., *A Revised Underwater Image Formation Model*. [IEEE CVPR*](#) 2018

5. Stoddard, M.C., Miller, A.E., Eyster, H., & **Akkaynak, D.**, *I See Your False Colors: How Artificial Stimuli Appear to Different Animal Viewers*. Interface Focus 9 (1), 20180053 2018

2017

6. **Akkaynak, D.**, Treibitz, T., Shlesinger, T., Tamir, R., Iluz, D., Loya, Y., *What is the Space of Attenuation Coefficients in Underwater Computer Vision?* [IEEE CVPR*](#) 2017

7. Stoddard, M.C., Yong, M.C., **Akkaynak, D.**, Sheard, C., Tobias J., and Mahadevan, L, *Morphometry, Evolution and Physics of Avian Egg Shape*. Science 356, no. 6344 (2017): 1249-1254

Press coverage ([NYT](#), [NatGeo](#), [the Atlantic](#), [Smithsonian](#))

8. Allen, J.J.A, **Akkaynak, D.**, Schnell, A.K., and Hanlon, R.T., *Dramatic Fighting by Male Cuttlefish for a Female Mate*. American Naturalist 190, no. 1 (2017): 144-151

Press coverage ([NYT](#), [NatGeo](#), [Newsweek](#), [Smithsonian](#))

9. Zweifel, A., **Akkaynak, D.**, Mass, T., and Treibitz, T., In situ *Analysis of Coral Recruits Using Fluorescence Imaging*. *Frontiers in Marine Science* 4 (2017): 273
10. Dell' Aglio, DD., **Akkaynak, D.**, McMillan, WO., & Jiggins, CD. *Estimating the Age of Heliconius Butterflies From Calibrated Photographs*, *PeerJ*, 5, (2017) e3821
11. **Akkaynak, D.**, Siemann, L.A., Barbosa A., and LM Mäthger, *Changeable Camouflage: How Well Can Flounder Resemble the Colour and Spatial Scale of Substrates in Their Natural Habitats?* *Royal Society Open Science* 4 (3) 2017, 160824

Press coverage: Oceanbites.org

2016

12. Ermis M, **Akkaynak D**, Chen P, Demirci U, Hasirci V. A, *A High Throughput Approach For Analysis of Cell Nuclear Deformability at Single Cell Level*. *Scientific Reports* 6 (2016): 36917

Press coverage: [NTV](#) (Turkish news channel)

13. Gruber, David F., Loew, ER, Deheyn, DD, **Akkaynak, D**, Gaffney, JP, Smith, WL, Davis, MP, Stern, JH, Pieribone, VA, and Sparks, JS. *Biofluorescence in catsharks (Scyliorhinidae): fundamental description and relevance for elasmobranch visual ecology*. *Scientific reports* 6 (2016): 24751.

Press Coverage: [NatGeo](#), [the Atlantic](#), [From the Grapevine](#)

2015

14. Allen, J.J, **Akkaynak, D**, Sugden, A.U., and Hanlon, R.T., *Adaptive Body Patterning, Three-Dimensional Skin Morphology and Camouflage Measures of The Slender Filefish *Monacanthus tockeri* on a Caribbean Coral Reef*. *Biological Journal of the Linnean Society* 116, no. 2 (2015): 377-396
15. Fisher, E.C., **Akkaynak, D.**, Harris, J., Herries, A., Jacobs, Z., Karkanis, P., Marean, C., and McGrath, J.R. *Technical Considerations and Methodology for Creating High-Resolution, Color-Corrected, and Georectified Photomosaics of Stratigraphic Sections at Archaeological Sites*. *Journal of Archaeological Science* 57 (2015): 380-394
16. Buresch, K. C., Ulmer, K. M., **Akkaynak, D.**, Allen, J. J., Mäthger, L. M., Nakamura, M., & Hanlon, R. T. *Cuttlefish adjust body pattern intensity with respect to substrate intensity to aid camouflage, but do not camouflage in extremely low light*. *Journal of experimental marine biology and ecology*, (2015) 462, 121-126.

2014

17. **Akkaynak, D.**, Treibitz, T., Xiao, B., Gürkan, U.A., Allen, J.J., Demirci, U. and Hanlon, R.T. *Use of Commercial-off-the-shelf Digital Cameras For Scientific Data Acquisition and Scene-Specific Color Calibration*. *Journal of the Optical Society of America A* 2014, Vol. 31, Issue 2, pp. 312-321
18. **Akkaynak, D.** (2014). A computational approach to the quantification of animal camouflage (Doctoral dissertation, Massachusetts Institute of Technology).

19. **Akkaynak, D.** *Use of Spectroscopy For Assessment of Color Discrimination in Animal Vision*. Journal of the Optical Society of America A 2013, Vol. 31, Issue 4

20. **Akkaynak D.**, Allen, J.J., Mäthger, L.M., Chiao, C.C. and Hanlon R.T. *Quantification of Cuttlefish (Sepia officinalis) Camouflage: A Study of Color and Luminance Using in situ Spectrometry*. Journal of Comparative Physiology A 2013, Vol. 199, Issue 3, pp. 211-225

21. Gürkan, U. A., Taşoğlu, S., **Akkaynak, D.**, Avcı, O., Ünlüışler, S., Canikyan, S., MacAllum, N. and Demirci, U. (2012). *Smart interface materials integrated with microfluidics for on-demand local capture and release of cells*. Advanced healthcare materials, 1(5), 661-668.

22. **Akkaynak, D.** (2005). *Use of fuel cells for improving on-site emergency power availability and reliability at nuclear power plants* (Master's dissertation, Massachusetts Institute of Technology).

PATENTS

1. Gürkan, U.A., Demirci, U., **Akkaynak, D.** *Home healthcare portal for improved management of peritoneal dialysis therapy*. US patent 20150219545, issued, licensed.
2. Hasırcı, V., Ermiş, M., **Akkaynak, D.**, Demirci, U. *Mikrodesenler ve çekirdek deformasyonu temelli hücresel tanı sistemi* [A system to quantify cell deformation (e.g., cancer) from microscope images of cells.] Turkey patent #2016/15290, pending.
3. Akkaynak D., & Treibitz T. *Physics-based recovery of lost colors in underwater images*. US provisional patent 2019 # 62/850,752.

SCIENTIFIC LEADERSHIP

Co-chair and organizer, Automated Analysis of Marine Video for Environmental Monitoring Workshop, to be held at International Conference on Computer Vision 2019 (Seoul, South Korea)

ACADEMIC SERVICE

Optics Express, Biological Journal of the Linnaean Society, Journal of the Optical Society of America A, PLOS ONE, Nature Scientific Reports, Chinese Optics, IEEE CVPR

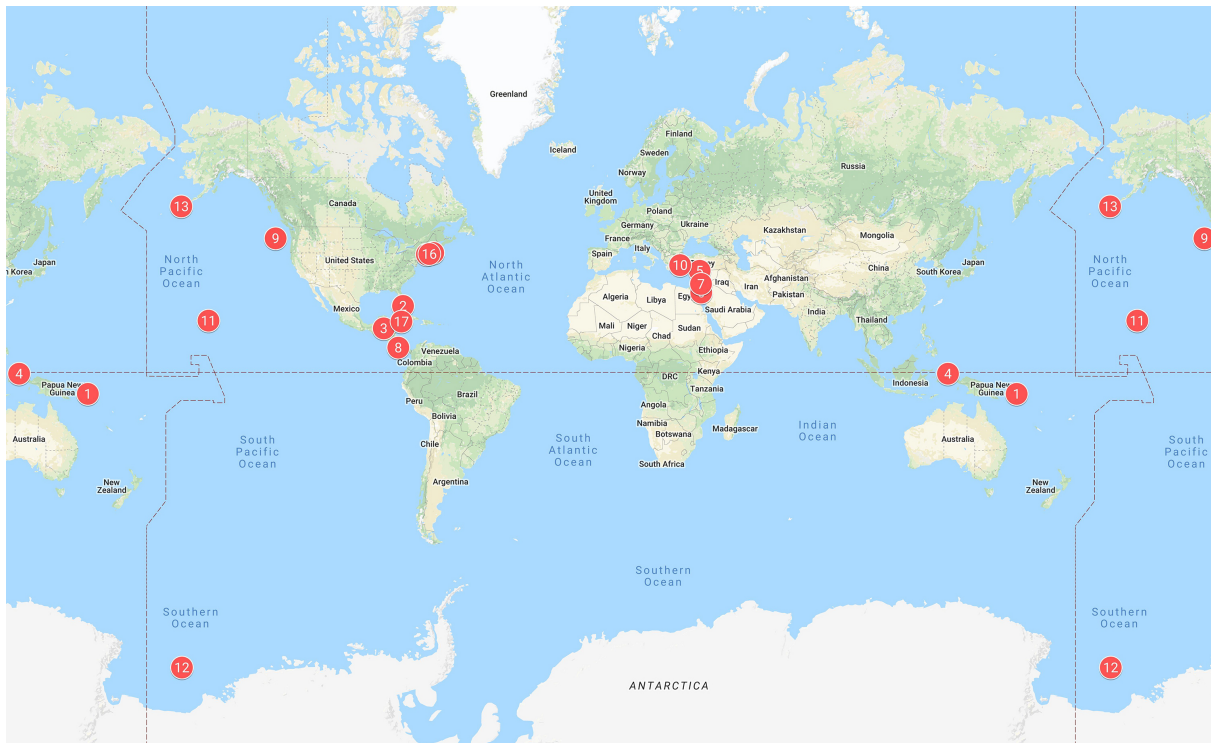
TEACHING & MENTORING

MIT EdX course “User Innovation uINOV8x”	Mentor	2016
Undergraduate students, University of Arizona	Mentor	2016
Graduate students, University of Haifa	Mentor	2015-2017
Graduate women students, MIT	Mentor	2015
Lincoln High School students, RI USA	Mentor	2014-2015

Math & physics
 Thermal Fluids Engineering I, MIT Mechanical Eng.
 Thermal Fluids Engineering II, MIT Mechanical Eng.
 Reactor Technology, MIT Nuclear Eng.

Private tutor 2002-2015
 Teaching assistant 2004-2005
 Teaching assistant 2004
 Teaching assistant 2004-2005

UNDERWATER FIELDWORK & OCEANOGRAPHIC CRUISES



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|---|---|
| ① Munda, Solomon Islands 2017 | ⑩ Urla, Turkey 2008-2011 |
| ② Florida Keys, 2017 | ⑪ Kona, Hawaii 2011 |
| ③ Carrie Bow Cay, Belize 2017 | ⑫ West Antarctic 2010 RRS James Clark Ross |
| ④ Raja Ampat, Indonesia 2016 MV Pindito | ⑬ Bering Sea, Alaska 2010 FV Ocean Explorer |
| ⑤ Mediterranean, Turkey 2016 RV Bilim | ⑭ Gulf Stream Current 2008 SSV Corwith Cramer |
| ⑥ Red Sea, Israel, 2015- 2018 | ⑮ Fort Wetherhill, RI, USA |
| ⑦ Mediterranean, Israel 2016-2017 | ⑯ Barnstable Pond, MA, 2007 |
| ⑧ Bocas del Toro, Panama 2015 | ⑰ Grand Cayman Island, 2007 |
| ⑨ Juan de Fuca Ridge 2014 RV Atlantis | |

INVITED/CONFERENCE TALKS

1. Weizmann Institute, Israel (Upcoming April 2019)
2. Vision Seminar, Hebrew University of Jerusalem (Upcoming April 2019)
3. Pillar Seminar, Harbor Branch Oceanographic Institute (Upcoming February 2019)
4. Guest Lecture, Sensory Ecology Class, Princeton University, November 2018.
5. Automated Analysis of Marine Video for Environmental Monitoring Workshop, IEEE CVPR Salt Lake City, UT, June 2018
6. Guest Lecture, Scientific Diving (AAUS) course at the Interuniversity Institute for Marine Sciences in Eilat, Israel, November 2017
7. The Israeli Association for Aquatic Sciences (IAAS), Israel, November 2016 & 2017
8. Marine Imaging Workshop, GEOMAR, Kiel, Germany, February 2017

9. Middle East Technical University, Inst. of Marine Sciences at Erdemli, Turkey, June 2016.
10. Arizona State University, Tempe, AZ, May 2016
11. Ben Gurion University, Israel, April 2016
12. Weizmann Institute, Israel, January 2016
13. Bezalel Academy, The Hebrew University of Jerusalem, Israel, December 2015.
14. Heliconius Meeting, Gamboa, Panama, July 2015
15. Fellows Symposium, Smithsonian Tropical Research Institute, Panama, March 2015
16. American University, Washington DC, January 2013
17. Bridgewater College, Biology Department, Bridgewater, VA, November 2013.
18. West Point United States Military Academy, West Point, NY, March 2013.
19. IEEE Ocean Sciences meeting at Kona, Hawaii, September 2011.

CERTIFICATIONS, MEMBERSHIPS & SKILLS

- SCUBA
 1. TDI Decompression procedures #700313, Bryan Hansen, 9 March 2016
 2. TDI Advanced nitrox #700307, Bryan Hansen, 9 March 2016
 3. AAUS Scientific Diver, Edward O'Brien, Woods Hole Oceanographic Institution, 30 June 2010
 4. PADI Divemaster #240585, 28 September 2008
 5. PADI Ice Diver #0704024407, Steven C. Brown, 13 March 2007
 6. PADI Rescue Diver #0704024402, Marc D. Gaskin, 2 April 2007
 7. PADI Digital Photographer #0611042484, Michael R. Guglielmo, 16 September 2006
 8. PADI Advanced Open Water #0508U98528, Ali Cam, 19 July 2005
 9. PADI Drysuit Diver #0505059596, Nikolai Schwertner, 15 May 2005
 10. PADI Nitrox Diver #0505059597, Nikolai Schwertner, 15 May 2005
 11. PADI Open Water #0502060057, Nikolai Schwertner, 19 March 2005
 12. CPR, Emergency First Response, Emergency Oxygen Administration (active)
- Certified Associate in Project Management (PMI, 2005-2012)
- Member of IEEE, The Oceanography Society, Sigma Xi, Underwater Research Society of Turkey
- MOOC (Massive Open Online Course) courses completed on Coursera with distinction: Computational Photography, Machine Learning, Image and Video Processing
- Driver's License: Auto (Class D), Motorcycle (M)
- Language: Turkish (Native), English (Excellent), Spanish (Beginner), Hebrew (Beginner)
- Programming: Matlab, R, Python, Javascript, XML, SQL, HTML, Dreamweaver, Raspberry Pi, Arduino
- Hyperspectral Sensor Experience: Resonon, SpectraCam, Ximea, Surface Optics

MEDIA & SCIENCE COMMUNICATION

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| 2019 | EUMETSAT | Case study on the use of Sentinel-3 color products. |
| 2018 | Boston Sea Rovers | Presenter at Saturday Evening Film Festival |
| 2018 | American Museum of Natural History | The hyperspectral camera whose development I led in the Marine Imaging Lab at Haifa is mentioned in an exhibit called Unseen Oceans at the AMNH. |
| 2017 | In The Deep | First episode of a Facebook sponsored series on ocean science, In the Deep, features our work filming |

		cephalopods in Indonesia with a hyperspectral camera. <i>[In The Deep series won the Edward R. Murrow award in 2018 for Feature Reporting in a Large Media Organization]</i>
2017	Tales from the sea (International Marine Conservation Congress'16)	A storytelling event where I told the story of why I left a high paying consulting job to pursue a (low-paying) career in oceanography. Also a blog post about the event.
2017	Kurk	A travel essay I had posted on my personal blog about cork tree cultivation in Portugal was translated to Dutch, and featured in an architecture magazine – each issue is made by hand.
2016	Sea Blindness or Ocean Optimism?	The blog of Port Towns and Urban Cultures group at the University of Portsmouth covers divers4oceans
2015	USER INNOVATION: A Path to Entrepreneurship (MIT EdX class UINOV8X)	The divers4oceanography project is covered in a full class of MIT's online class on User Innovation as an example of <i>peer-to-peer diffusion</i> .
2015	Epiphany Among the Manta Rays	Oceanus Magazine (WHOI publication) covers the story of divers4oceans , a citizen science project I started in 2011 to collect temperature data from scuba divers
2015	Patterned Behavior	Sport Diver Magazine covers my research on cephalopod camouflage. <i>[August 2015 issue. PDF available upon request.]</i>
2013	A War of Knowledge to Save Sharks.	Oceanus Magazine (WHOI publication) story about my shark conservation efforts in Turkish waters.
2013	Biz o ahtapotu anca yeriz.	Science columnist Ilker Birbil covers my work on octopus camouflage. (Radikal: daily newspaper in Turkey)
2013	“Devlet politika belirken bilimsel verileri dikkate almıyor”	Journalist Işıl Öz interviews me regarding science, policy and politics in Turkey (T24.com.tr: Turkish online news site)
2013	Mathematical Philanthropy	Article on my book donation campaign from MIT to Nesin Mathematics Village in Turkey.
2013	Daimi öteki: köpekbalığı	Columnist Tan Morgül's coverage of shark conservation in Turkish waters. (Radikal: daily newspaper in Turkey)
2012	The secret lives of researchers: Fig.3 versus the editor	MIT's student newspaper The Tech covers the story of a journal editor asking me to put 56 redundant labels on my figure.
2010	T-shirts in Antarctica, snow in the UK	A warm day during our research expedition to Antarctica covered in the Daily Mail UK.
2007	Thrill seekers find chills in ice diving	Boston Globe covers our Ice Diving Certification class, in which I was the only woman.