

ANTONELLA WILBY

awilby@eng.ucsd.edu | cseweb.ucsd.edu/~awilby

Robotist and ocean engineer specialized in developing autonomous robotic systems for environmental monitoring and exploration of extreme environments. National Geographic Explorer. Adventure photographer, scientific diver, and experienced outdoorswoman. Passionate about conservation, science communication, and exploration.

Ph.D. Student, Computer Science, 2016–2021 (expected completion)

University of California, San Diego

Contextual Robotics Institute, Jacobs School of Engineering

Research Area: vision-based Simultaneous Localization and Mapping (SLAM) in underwater multi-robot systems

Advisors: Henrik Christensen and Jules Jaffe

2015 **Bachelor of Science, Computer Science**

University of California, San Diego

RESEARCH INTERESTS

Field robotics, marine robotics, SLAM (Simultaneous Localization and Mapping), multi-robot systems, environmental monitoring, autonomous underwater vehicles, sensor networks, bio-inspired robotics, underwater optics and computer vision. Using robotics and technology to advance environmental conservation and ocean exploration.

RESEARCH & PROFESSIONAL POSITIONS

Jan 2017–	University of California, San Diego , Contextual Robotics Institute: Graduate Student Researcher
Aug 2018–	E/V Nautilus Corps of Exploration , Ocean Exploration Trust: ROV Engineer & Pilot
2015, 2017	University of California, San Diego , Computer Science and Engineering Department: Teaching Assistant
2012–2017	University of California, San Diego , Engineers for Exploration: Lead Field Engineer
Jun–Aug 2013	University of California, Berkeley , Computational Imaging Lab: Undergraduate Research Fellow
Jun–Aug 2012	Harvey Mudd College , Robotics Lab: Undergraduate Research Fellow
2012–2013	Glendale Community College , GCC Robotics Academy: Robotics Curriculum Developer
2011–2012	NASA Jet Propulsion Laboratory , Digital Image Animation Laboratory: Research Intern

PUBLICATIONS

([†]denotes students supervised, *denotes co-first authors)

Refereed Conference Papers:

- [C3] **A. Wilby** and H. Christensen, “Open-Source Hovering Autonomous Underwater Vehicle (HAUV) for Marine Robotics Research,” *OCEANS '19 MTS/IEEE*, Marseille, France, June 17-20, 2019. (*accepted*)
- [C2] **A. Wilby**, E. Slattery[†], A. Hostler[†], and R. Kastner, “Autonomous Acoustic Trigger for Distributed Underwater Visual Monitoring Systems,” *WUWNet '16: 11th ACM Conf. on Underwater Networks and Systems*, Shanghai, China, Oct. 24-26, 2016. — **Best Paper Award Finalist**
- [C1] **A. Wilby**, A. Hostler[†], E. Slattery[†], and R. Kastner, “Design of a Low-Cost and Extensible Acoustically-Triggered Camera System for Marine Population Monitoring,” *OCEANS '16 MTS/IEEE*, Monterey, CA, Sept. 19-22, 2016.

Workshop Papers & Presented Conference Abstracts:

- [W6] **A. Wilby** and H. Christensen, "Gesture Control and Situation Awareness in Underwater Human-Robot Teams." (*under review*)

- [W5] I. Tolkova*[†] and L. Bauer*[†], **A. Wilby**, R. Kastner, K. Seger, “Automatic Classification of Humpback Whale Social Calls,” *173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum*, Boston, MA, June 25-29, 2017.
- [W4] D. Rissolo, A. Nava Blank, V. Petrovic, M. Bianco, P. Naughton, E. Lo, **A. Wilby et al**, “Refining Techniques for Underwater Structure-from-Motion (SfM) Image Acquisition and Processing,” *Computer Applications in Archaeology Conference*, Siena, Italy, March 30-April 3rd, 2015.
- [W3] P. Bojakowski, K.C. Bojakowski, P. Naughton, M. Bianco, and **A. Wilby**, “Emerald Bay Project: Digital Monitoring of the Two 19th-century Submerged Barges,” *The Digital Age: Advances to Underwater Archaeological Survey Techniques at SHA 2015 Conference on Historical and Underwater Archaeology*, Seattle, WA, Jan. 6-11, 2015.
- [W2] P. Naughton, **A. Wilby**, and R. Kastner, “Accurate 3D Models for Maritime Cyber-Archaeology through Multi-Modal Localization,” *Robotics: Science and Systems 2014 Workshop on Autonomous Control, Adaptation, and Learning for Underwater Vehicles*, Berkeley, CA, July 12, 2014.
- [W1] A. Dobke, D. Greene, D. Hernandez, C. Hunt, M. McDermott, L. Reed, V. Wehner, **A. Wilby**, and Z. Dodds, “Anchoring AI Via Robots and ROS,” *Robotics Multimedia Fair at the Twenty-Sixth AAAI Conference on Artificial Intelligence*, Toronto, Canada, July 2012.

INVENTION DISCLOSURES

- [1] A. Wilby and R. Kastner, “System for Acoustic-Visual Monitoring of Marine Environments,” U.S. Provisional Patent Appl. 62/412,186, Oct. 24, 2016.

RESEARCH FUNDING

Grants:

- [4] Exploration Grant, National Geographic Society (Jan. 2018): *Swarm Robotic Coral Reef Mapping*
- [3] Exploration Fund Grant—2016 Mamont Scholars Program, The Explorers Club (April 2016): *Visual Monitoring of Vaquita, the World’s Most Endangered Cetacean*
- [2] Field Research Grant, The Explorers Club—San Diego Chapter (April 2016): *Visual Monitoring of Vaquita, the World’s Most Endangered Cetacean*
- [1] Young Explorers Grant, National Geographic Society (Jan. 2015): *Documentation and Monitoring of Vaquita, the Most Endangered Cetacean*

Fellowships:

- 2017 NSF Graduate Research Fellowship, National Science Foundation
- 2017 Ocean Engineering & Instrumentation PhD Fellowship, Link Foundation (*declined*)
- 2015 Sloan Scholar, Alfred P. Sloan Minority PhD Program (awarded in 2015-2016)
- 2015 Frontiers of Innovation Scholars Program Project Fellowship, UC San Diego
- 2014 NSF Research Experiences for Undergraduates Fellowship, UC San Diego
- 2013 NSF Research Experiences for Undergraduates Fellowship, UC Berkeley
- 2012 NSF Research Experiences for Undergraduates Fellowship, Harvey Mudd College

INVITED TALKS

- [6] EXPLORE Panelist, *NOAA National Ocean Exploration Forum 2018: All Hands On Deck*, MIT Media Lab, Cambridge, MA, Nov. 2018.
- [5] “Robot Explorers: Technology for a New Age of Ocean Conservation,” *Glendale Community College: Science Lecture Series*, Glendale CA, May 2017.
- [4] “Technology and Robotics for Ocean Conservation,” *National Geographic Society: Family Day*, Washington, D.C., Feb. 2017.
- [3] “Soldering ‘Round the World: An Engineer’s Guide to Fieldwork,” *National Geographic Live: The Geeks*, Washington, D.C., Jul. 2016.
- [2] “Technology-Enhanced Conservation of the Mexican Vaquita,” *UCSD Corporate Affiliates Program Board Meeting*, San Diego, CA, Jun. 2016.

- [1] “Technology-Enhanced Conservation of the Mexican Vaquita,” *National Geographic Committee for Research and Exploration: Baja Field Inspection*, La Paz, Mexico (aboard Lindblad Expeditions Sea Bird), Jan. 2016.

FIELD OPERATIONS & EXPEDITION EXPERIENCE

- Jun 2018– Scientific Diver, Scripps Institution of Oceanography, 30+ dives (30' depth clearance), San Diego, California
Aug 2018 Research Lead, ROV fieldwork at Hawai'i Institute of Marine Biology (HIMB), Oahu, Hawai'i
2015–2017 Expedition Leader, Vaquita Documentation and Monitoring Expedition, San Felipe, Baja California, Mexico
Jul 2016 Field Engineer, The Explorers Club Heart of the Arctic, Greenland and Canada
Jun 2014 Lead Field Engineer, Lake Tahoe Barge Monitoring Project, Emerald Bay, Lake Tahoe, California

CERTIFICATIONS & TRAINING

- Motorboat Operator Training Course:** Scripps Institution of Oceanography, *Oct. 2018*
AAUS Scientific Diver: American Academy of Underwater Sciences (AAUS) / Scripps Institution of Oceanography, *Jun. 2018*
NAUI Rescue Diver and Nitrox Certifications: National Association of Underwater Instructors (NAUI), *Jun. 2018*
Emergency O2 Administration: Divers Alert Network, *current through 2020*
CPR, AED, and First Aid: American Heart Association, *current through 2020*

HONORS & AWARDS

- 2018 Lee Selisky Future Diving Leader, Academy of Underwater Arts and Sciences (AUAS)
2017 Engineering Leadership Award (Gordon Fellow), UCSD Bernard and Sophia Gordon Engineering Leadership Center
2017 Intel Edison “Tommy” Award, Intel / Edison Innovation Foundation
2016 SeaDrone Innovation Challenge Winner, ORobotix
2016 Adventure Canada Young Scholars Award, The Explorers Club
2015 Honorable Mention, National Science Foundation Graduate Research Fellowship Program
2015 Undergraduate Award for Outstanding Contributions to Research, UCSD Computer Science and Engineering Dept.
2015 Honorable Mention, National Center for Women & Information Technology Collegiate Award
2013 Grace Hopper Conference Scholarship, UCSD Women in Computing
2011 Paul Dozois Memorial Scholarship, Glendale Community College

SERVICE

Professional Service:

- 2019 GeoChallenge Appraiser, GeoChallenge 2019: Tackling Plastic!, National Geographic Education
2018– Explorer Advisory Panel, National Geographic Society
Oct 2017 Rapporteur, NOAA National Ocean Exploration Forum 2017: Ocean Exploration in a Sea of Data

University Service:

- Jan 2019– Volunteer SCUBA Diver, Birch Aquarium at Scripps Institution of Oceanography
2016–2017 Assistant Wilderness Guide, UCSD Outback Adventures
2016–2017 Event Coordinator, Graduate Women in Computing at UCSD
2016 Student Seed Fund Award, National Center for Women & Information Technology, sponsored by Google (grant written for UCSD Graduate Women in Computing to support development of departmental mentorship program)
2016 Graduate Student Committee Member, UCSD CSE Dept. Faculty Candidate Recruiting
2013– Gordon Scholar, UCSD Gordon Engineering Leadership Center
2010–2012 Founder, Project Manager and Mechanical Subteam Lead, Glendale Community College Robotics Team
2009–2012 Cello Section Member, Glendale College Community Orchestra

Outreach & Mentoring:

- 2018–2019 Public Outreach Chair, UCSD RoboGrads (Association of Robotics Graduate Students)
- 2016 Undergraduate Research Mentor, Engineers for Exploration REU
- 2013–2014 Outreach Chair, Women in Computing at UCSD
- 2009–2011 Mentor, FIRST Robotics Team 696 at Clark Magnet High School

SCIENCE COMMUNICATION

Photography:

- May 2018 BBC News, *In pictures: California's neon blue tide*
- Jun 2017 Field Photographer, Powers lab hummingbird research (Chiricahua Mountains, Arizona)
- 2012–2015 Expedition Photographer, UCSD Engineers for Exploration (multiple field expeditions)
- Sept 2014 ZONOOZ, *Community-based Conservation of the Mexican Vaquita*
- 2012– Freelance Photographer, adventure, science, and conservation photography focus

Writing:

- Science Outside: *Soldering 'Round the World: Engineering and Virtual Reality in the Arctic*, Sept. 2017
- National Geographic Blog: *Brink of Extinction: A Technological Approach to Saving the Last Vaquita Porpoises*, Jan. 2016

Media Training:

- Jul 2017 National Geographic Sciencetelling Bootcamp, Washington, D.C.
- Apr 2017 IWFF Labs, International Wildlife Film Festival, Missoula, Montana

Selected Media Features:

- United Nations Environment Programme: *Meet Six Environmentalists who are Changing the World*, Jan. 2019
- National Geographic Encounter: *Ocean Odyssey*, Oct. 2017–present
- Intel IQ: *Smart Underwater Imaging Aims to Save Endangered Marine Species*, Jan. 2017
- National Geographic Ocean: Live Interview for National Geographic Ocean, Jul. 2016
- This Week @ UC San Diego: *Capturing Public Support for an Endangered Species Through Photography*, Apr. 2016
- Wild Lens: *A Unique Approach for Capturing Vaquita Footage*, Oct. 2015

TEACHING EXPERIENCE

University of California, San Diego: Teaching Assistant

- 2017 CSE 190: Micro-Quadcopter from Scratch, Spring 2017
- 2017 CSE 130: Programming Languages, Winter 2017
- 2015 CSE 190: Introduction to Robotics, Winter 2015

PROFESSIONAL AFFILIATIONS

Association for the Advancement of Artificial Intelligence (AAAI), Association for Computing Machinery (ACM), Institute of Electrical and Electronics Engineers (IEEE), Marine Technology Society (MTS), National Geographic Society, Society of Women Engineers (SWE), The Explorers Club