

2016 ICPR 2nd Workshop on Computer Vision for Analysis of Underwater Imagery (CVAUI 2016)

**Cancun, Mexico
4 December 2016**



**IEEE Catalog Number: CFP16A67-POD
ISBN: 978-1-5090-5871-6**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16A67-POD
ISBN (Print-On-Demand):	978-1-5090-5871-6
ISBN (Online):	978-1-5090-5870-9

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2nd Workshop on Computer Vision for Analysis of Underwater Imagery

CVAUI 2016

Table of Contents

Message from the Workshop Co-Chairs.....	vii
Organizing Committee.....	viii
Program Committee.....	ix
Invited Talk 1 by Henry Ruhl.....	x
Invited Talk 2 by Anthony Hoogs.....	xi
Invited Talk 3 by Yogesh (Yogi) Girdhar.....	xii

Oral Presentations 1

Polyp Activity Estimation and Monitoring for Cold Water Corals with a Deep Learning Approach	1
<i>Jonas Osterloff, Ingunn Nilssen, Johanna Järnegren, Pål Buhl-Mortensen, and Tim W. Nattkemper</i>	
Closed-Loop Tracking-by-Detection for ROV-Based Multiple Fish Tracking	7
<i>Gaoang Wang, Jenq-Neng Hwang, Kresimir Williams, and George Cutter</i>	
Data-Driven Long Term Change Analysis in Marine Observatory Image Streams	13
<i>Torben Möller, Ingunn Nilssen, and Tim W. Nattkemper</i>	
Adaptive Foreground Extraction for Deep Fish Classification	19
<i>Nicole Seese, Andrew Myers, Kaleb Smith, and Anthony O. Smith</i>	
Live Tracking of Rail-Based Fish Catching on Wild Sea Surface	25
<i>Tsung-Wei Huang, Jenq-Neng Hwang, Suzanne Romain, and Farron Wallace</i>	
Shrinking Encoding with Two-Level Codebook Learning for Fine-Grained Fish Recognition	31
<i>Gaoang Wang, Jenq-Neng Hwang, Kresimir Williams, Farron Wallace, and Craig S. Rose</i>	

Oral Presentations 2

Surface Stereo for Shallow Underwater Scenes	37
<i>Scott Sorensen, Wayne Treible, and Chandra Kambhamettu</i>	
Data Enrichment in Fine-Grained Classification of Aquatic Macroinvertebrates	43
<i>Jenni Raitoharju, Ekaterina Riabchenko, Kristian Meissner, Iftikhar Ahmad, Alexandros Iosifidis, Moncef Gabbouj, and Serkan Kiranyaz</i>	
Shape Reconstruction of Objects in Participating Media by Combining Photometric Stereo and Optical Thickness	49
<i>Yuki Fujimura, Masaaki Iiyama, Atsushi Hashimoto, and Michihiko Minoh</i>	
Plankton Image Classification Based on Multiple Segmentations	55
<i>Nina S.T. Hirata, Mariela A. Fernandez, and Rubens M. Lopes</i>	
Author Index	61