

# JEFFREY W. KAEELI

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## INTRODUCTION

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Mobile platforms, from autonomous vehicles to smart phones, are capable of capturing optical imagery in volumes that are too vast to be exhaustively analyzed by trained human observers. My research interests focus around using computer vision and machine learning techniques to quantitatively answer scientific questions about these datasets and streamline the interaction between humans and computers in analyzing visual data.

## EDUCATION

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Ph.D. Candidate in OCEANOGRAPHIC ENGINEERING (expected 2013) **MIT/WHOI Joint Program**

Thesis: (working title) *Computational Strategies for Understanding Large Underwater Optical Image Datasets*

Advisor: Hanumant Singh (WHOI)

Committee: John Leonard (MIT), Ramesh Raskar (MIT)

B.S. in MECHANICAL ENGINEERING, Minor in BIOLOGY, *Magna Cum Laude* (2007) **Virginia Tech**

## EXPERIENCE

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**Teaching Assistant** at VIRGINIA TECH, Blacksburg, VA (8/2005 - 5/2007)

*Department of Engineering Education*

- *ENGE 1024: Engineering Exploration*, a mandatory course for all freshmen engineers
- taught hands-on curriculum-based recitations of 30 students

**Grading Coordinator** at VIRGINIA TECH, Blacksburg, VA (8/2005 - 5/2007)

*Department of Engineering Education*

- developed problem sets and solution manuals for *ENGE 1024: Engineering Exploration*
- managed team of a half dozen undergraduate graders for a class of 1200+ students

**Summer Student Fellow** at WOODS HOLE OCEANOGRAPHIC INSTITUTION, Cape Cod, MA (summer 2006)

*Deep Submergence Laboratory*

- enhanced training for benthic classification algorithms using linear discriminants

**Guest Student** at WOODS HOLE OCEANOGRAPHIC INSTITUTION, Cape Cod, MA (summer 2005)

*Deep Submergence Laboratory*

- segmented transect imagery of deep-water coral reefs using simple nonlinear texture features

**Engineering Intern** at INGERSOLL-RAND CORPORATION, Mocksville, NC (summer 2004)

- led projects to improve inventory accuracy and product workflow in the sheet metal fabrication shop

**Nature Director** at BOY SCOUT CAMP SHENANDOAH, Swope, VA (summer 2003)

- taught merit badge classes in Environmental Science and Astronomy
- managed team of 3 instructors teaching additional merit badge classes

## PUBLICATIONS

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- Eastman, J.T., Amsler, M.O., Aronson, R.B., Thatje, S., McClintock, J.B., Vos, S.C., **Kaeli, J.W.**, Singh, H., and La Mesa, M. *Photographic survey of benthos provides insights into the Antarctic fish fauna from the Marguerite Bay slope and the Amundsen Sea*. Antarctic Science (2012).

- **Kaeli, J.W.**, Singh, H., Murphy, C. and Kunz, C. *Improving Color Correction for Underwater Image Surveys*. Proceedings of IEEE/MTS OCEANS, Kona, HI. 2011.
- **Kaeli, J.W.**, Singh, H., and Armstrong, R.A. *An Automated Morphological Image Processing Based Methodology for Quantifying Coral Cover in Deeper-Reef Zones*. Proceedings of IEEE/MTS OCEANS, Boston, MA. 2006.
- Snook, J.S., Lohani, V.K., Lo, J., Sirvole, K., Mullin, J., **Kaeli, J.W.**, and Griffin, H. *Incorporation of a 3-D Interactive Graphics Programming Language into an Introductory Engineering Course*. Proceedings of ASEE Annual Conference, Portland, OR. 2005.

## FIELD WORK

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- **tracking invasive predatory crabs on the continental shelf and slope of Antarctica**
  - 52 days aboard icebreakers *R/V Nathaniel B. Palmer* and *R/V Oden* in the Southern Ocean (11/2010 - 1/2011)
  - deployed and operated SeaSLED towed camera system
  - developed MATLAB GUIs for dataset annotation and organism sizing
  - part of the Antarctic ASPIRE project <http://antarcticaspire.org/>
- **imaging benthic habitats affected by the Deepwater Horizon oil spill**
  - 7 days aboard *R/V Walton Smith* in the Gulf of Mexico (9/2010)
  - deployed and operated SeaSLED towed camera system
- **range-only active target reacquisition and imaging sonar surveys of target**
  - 1-week demonstrations at Naval Support Activity, Panama City, FL (8/2009, 9/2010)
  - data analysis and target characterization using REMUS autonomous underwater vehicle
- **ship hull inspection using high-frequency multibeam sonar**
  - 1-week demonstration at Newport Naval Station, Newport, RI (5/2008)
  - 2-week demonstration at Eckernförde Naval Base, Kiel, Germany (8/2008)
  - multibeam map construction for target detection using REMUS autonomous underwater vehicle
- **introductory oceanography cruise for first year graduate students**
  - 10 days aboard the *SSV Corwith Cramer* in the North Atlantic Ocean (6/2007)

## AWARDS

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- Second Place, Undergraduate Student Poster Session at *IEEE/MTS OCEANS* (2006)
- **Dean's List of Instructors** at Virginia Tech (fall 2005, fall 2006)
- **Dean's List of Students** at Virginia Tech, *all semesters* (fall 2002 - spring 2007)
- **Eagle Scout Award** (2001)