Jeffrey A. Delmerico

Contact Information	Winzerhalde 105 8049 Zürich, Switzerland	*Mobile:* +41 76 394 62 84 *E-mail:* jeffdelmerico@gmail.com *Website:* jeffdelmerico.com
Citizenship	United States	
Date of Birth	June 19, 1980	
Languages	English (native), German (intermediate - B2), French (basic)	

Profile

A dedicated researcher, experienced at working independently and in teams, on state of the art robotics software and hardware. With excellent communication, problem solving, and management skills, and a history of developing successful collaborations, I look forward to bringing my depth and breadth of experience to an industry research role.

Areas of Research Expertise

Navigation and mapping, visual-inertial state estimation, stereo/3D vision, semantic perception, and machine learning for mobile robotics, particularly for deployment in real-world environments.

Technical Skills

Programming/Software Packages

- *High Proficiency*: C++11 and STL, Python, git, ROS, OpenCV, Eigen, LaTeX CMake
- *Functional Proficiency*: Matlab, C, PCL, Caffe, TensorFlow, CUDA, Adobe Creative Suite, LCM, UNIX shell scripting, OpenMP, MPI

Robotics

- Implementation of perception algorithms with various sensor modalities (monocular and multi-sensor cameras, RGB-D sensors, and laser range finders).
- Systems integration for custom built drones, ground platforms (e.g. iRobot Packbot and Kuka youBot), as well as surface and underwater autonomous marine robots.
- Organization of experiments, tests, and demonstrations of robotic systems both inside and outside of the laboratory.
- Clear communication of technical problems, methods, and results in oral, visual, and written media.

Professional Experience

Robotics and Perception Group, University of Zürich/ETH Zürich, Switzerland

Senior Researcher **August 2014 to Present**

- Developing 3D perception, path planning, and active vision algorithms for small camera-equipped autonomous drones.
- Integration of visual odometry software from this lab (SVO) on a commercial inspection drone platform (senseFly Albris).
- Leading UZH Teams for the DARPA Fast Lightweight Autonomy program (FLA) and the Mohamed Bin Zayed International Robotics Competition, including four weeks of field experiments testing autonomous GPS-denied quadrotor systems in challenging navigation environments at military air bases in the USA.
- Organizing and implementing systems integration for NCCR Robotics demonstrations involving multiple labs and robots (from EPFL, ETHZ, UZH, and IDSIA).
- Supervised semester and master thesis projects for master students from ETH and UZH, and provided research guidance and supervision to PhD students in the lab.

Field Robotics Laboratory, University of Hawai'i at Manoa, Honolulu, Hawai'i USA

Postdoctoral Researcher **August 2013 to August 2014**

- Software and system development supporting an autonomous underwater cable-laying vehicle, and a surface vessel in an autonomous port security mapping and sensor platform role, including extensive field testing of both platforms in ocean environments.
- Three week research cruise aboard the US National Oceanic and Atmospheric Administration (NOAA) Research Vessel *Okeanos Explorer*. Participated in launch, recovery, navigation, piloting, and maintenance of remotely operated vehicle *Deep Discoverer* and camera platform *Seirios*.
- Instruction: lecturer for upper-level bachelor's course: Dynamic Systems Laboratory, Spring 2014.

US Army Research Laboratory, Adelphi, Maryland USA

Summer Intern/Research Assistant **Summers 2010 to 2012**

- Developed and deployed systems for building facade modeling, vision-based semantic classification of 3D laser scans, and stairway modeling for autonomous multi-floor exploration.

University at Buffalo, Buffalo, New York USA

Research Assistant/Teaching Assistant **September 2007 to June 2013**

- Research with the Vision and Perceptual Machines Laboratory (VPML) on computer vision algorithms for mobile robotics platforms.
- Instruction for courses in Calculus, Differential Equations, Numerical Analysis, Discrete Structures, Algorithms, and Data Structures.

Roswell Park Cancer Institute, Buffalo, New York USA

Research Assistant/Programmer **August 2008 to August 2009**

- Implemented application for IMRT radiation treatment optimization in conjunction with University at Buffalo's Center for Computational Research.

Holy Angels Academy, Buffalo, New York USA

High School Teacher **September 2003 to June 2006**

- Taught Physics, Earth Science, and Advanced Placement Physics.

Education

University at Buffalo, The State University of New York
Buffalo, New York USA

Ph.D., Computer Science and Engineering, September 2013

- Advisor: Associate Professor Jason Corso
- Dissertation Title: *Attributed Object Maps: Descriptive Object Models as High-level Semantic Features for Mobile Robotics*

Advanced Graduate Certificate in Computational Science, Mathematics, June 2008

M.A., Mathematics, June 2008

- Advisor: Professor Brian Spencer
- Areas of Study: Applied Mathematics, Computational Science

B.A., Mathematics and Physics, June 2003

- *Magna cum laude*
- Honors Scholar
- New York State Teaching Certification in Physics and Mathematics

Awards

University at Buffalo

- Presidential Fellowship, 2008 – 2012
- Computer Science and Engineering Artificial Intelligence Research Area Award, 2011
- Outstanding Senior Award, Physics Department, 2003
- Physics Department Sekula Scholarship, 2000 – 2002
- Honors Scholarship, 1998 – 2002

Journal Publications

[J1] K. Mohta, M. Watterson, Y. Mulgaonkar, S. Liu, C. Qu, A. Makineni, K. Saulnier, K. Sun, A. Zhu, **J. Delmerico**, K. Karydis, N. Atanasov, G. Loianno, D. Scaramuzza, K. Daniilidis, C. J. Taylor, and V. Kumar, "Fast, autonomous flight in gps-denied and cluttered environments," *J. of Field Robotics (JFR)*, vol. 35, no. 1, pp. 101–120, 2018, ISSN: 1556-4967. DOI: 10.1002/rob.21774

[J2] **J. Delmerico**, S. Isler, R. Sabzevari, and D. Scaramuzza, "A comparison of volumetric information gain metrics for active 3d object reconstruction," *Autonomous Robots*, pp. 1–12, 2017, ISSN: 1573-7527. DOI: 10.1007/s10514-017-9634-0

[J3] **J. Delmerico**, E. Mueggler, J. Nitsch, and D. Scaramuzza, "Active autonomous aerial exploration for ground robot path planning," *IEEE Robotics and Automation Letters (RA-L)*, 2016

[J4] M. Mancini, G. Costante, P. Valigi, T. A. Ciarfuglia, **J. Delmerico**, and D. Scaramuzza, "A domain independent approach for learning-based monocular depth estimation," *IEEE Robotics and Automation Letters (RA-L)*, 2016

[J5] G. Costante, **J. Delmerico**, M. Werlberger, P. Valigi, and D. Scaramuzza, "Exploiting photometric information for planning under uncertainty," *Springer Tracts in Advanced Robotics (ISRR)*, 2016

[J6] **J. A. Delmerico**, P. David, and J. J. Corso, "Building facade detection, segmentation, and parameter estimation for mobile robot stereo vision," *Image and Vision Computing*, vol. 31, no. 11, pp. 841–852, 2013

[J7] T. C. Scofield, **J. A. Delmerico**, V. Chaudhary, and G. Valente, "Xtremedata dbx: An fpga-based data warehouse appliance," *Computing in Science & Engineering*, vol. 12, no. 4, pp. 66–73, 2010

Conference Publications

[C1] **J. Delmerico** and D. Scaramuzza, "A benchmark comparison of monocular visual-inertial odometry algorithms for flying robots," in *IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2018

[C2] D. Falanga, A. Zanchettin, A. Simovic, **J. Delmerico**, and D. Scaramuzza, "Vision-based autonomous quadrotor landing on a moving platform," in *International Symposium on Safety, Security, and Rescue Robotics (SSRR)*, 2017

[C3] R. Kaeslin, P. Fankhauser, E. Stumm, Z. Taylor, E. Mueggler, **J. Delmerico**, D. Scaramuzza, R. Siegwart, and M. Hutter, "Collaborative localization of aerial and ground robots through elevation maps," in *International Symposium on Safety, Security, and Rescue Robotics (SSRR)*, 2016

[C4] **J. Delmerico**, A. Giusti, E. Mueggler, L. M. Gambardella, and D. Scaramuzza, "On-the-spot training for terrain classification in autonomous air-ground collaborative teams," in *International Symposium on Experimental Robotics (ISER)*, 2016

[C5] S. Isler, R. Sabzevari, **J. Delmerico**, and D. Scaramuzza, "An information gain formulation for active volumetric 3d reconstruction," in *IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2016

[C6] A. H. Sylvester, **J. A. Delmerico**, A. Z. Trimble, and B. S. Bingham, "Variable buoyancy control for a bottom skimming autonomous underwater vehicle," in *OCEANS*, IEEE, St. John's, 2014, pp. 1–6

[C7] **J. A. Delmerico**, D. Baran, P. David, J. Ryde, and J. J. Corso, "Ascending stairway modeling from dense depth imagery for traversability analysis," in *IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2013, pp. 2283–2290

[C8] J. Ryde and **J. A. Delmerico**, "Extracting edge voxels from 3d volumetric maps to reduce map size and accelerate mapping alignment," in *Ninth Conference on Computer and Robot Vision (CRV)*, IEEE, 2012, pp. 330–337

[C9] **J. A. Delmerico**, P. David, and J. J. Corso, "Building facade detection, segmentation, and parameter estimation for mobile robot localization and guidance," in *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2011, pp. 1632–1639

[C10] D. R. Schlegel, A. Y. Chen, C. Xiong, **J. A. Delmerico**, and J. J. Corso, "Airtouch: Interacting with computer systems at a distance," in *IEEE Workshop on Applications of Computer Vision (WACV)*, IEEE, 2011, pp. 1–8

[C11] **J. A. Delmerico**, J. J. Corso, and P. David, "Boosting with stereo features for building facade detection on mobile platforms," in *Western New York Image Processing Workshop (WNYIPW)*, IEEE, 2010, pp. 46–49

[C12] **J. A. Delmerico**, N. A. Byrnes, A. E. Bruno, M. D. Jones, S. M. Gallo, and V. Chaudhary, "Comparing the performance of clusters, hadoop, and active disks on microarray correlation computations," in *International Conference on High Performance Computing (HiPC)*, IEEE, 2009, pp. 378–387

THESIS

[T1] **J. A. Delmerico**, "Attributed object maps: Descriptive object models as high-level semantic features for mobile robotics," PhD thesis, State University of New York at Buffalo (SUNY Buffalo), Buffalo, New York, USA, September 2013

REFERENCES

Available upon request