

Ryan DuToit

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Education

University of Minnesota

Minneapolis, MN

PhD in Computer Science, 3.6 GPA

2013 - Present

Selected coursework: Computational Geometry, Computer Vision, Estimation and Detection, Estimation in Robotics, Matrix Theory, Optimization, Probability Theory

Drake University

Des Moines, IA

Bachelors of Science, summa cum laude, 3.9 GPA

2009-2013

Majors: Computer Science, Mathematics, and Physics

Experience

MARS Lab, University of Minnesota

Minneapolis, MN

Research Assistant

2013 - Present

Development of real-time, vision-inertial localization and mapping algorithms for mobile devices (cell phones, tablets, wearables). Consistent and efficient 3D map-based localization.

Drake University

Des Moines, IA

Research Assistant

2011 - 2013

Developed computer simulations modeling an H_2^+ ion within strong laser fields. Produced highly efficient, parallel code, employing FORTRAN and MPI.

Programming Intern

2010 - 2013

Designed, developed, and tested web-server and iOS software for Drake University employees and students.

Auburn University

Auburn, AL

Undergraduate Researcher

2012

Studied and developed methods for unmanned aerial vehicle collision avoidance. Implemented algorithms in Robot Operating System.

Honors and Awards

Drake University, Dept. of Physics & Astronomy: Helmick Senior Scholar

2013

Drake University, Dept. of Physics & Astronomy: Physics Prize Scholarship

2009 - 2013

Skills

○ C/C++

○ MATLAB

○ Java

○ Android

○ iOS

○ Linux

○ Sensor Fusion

○ SLAM

○ Computer Vision

Journal Publications

[J3] C.X. Guo, K. Sartipi, R.C. DuToit, G.A. Georgiou, R. Li, J. O'Leary, E.D. Nerurkar, J.A. Hesche, and S.I. Roumeliotis, **"Resource-Aware Large-Scale Cooperative 3D Mapping using Multiple Mobile Devices"**, *IEEE Transactions on Robotics*, submitted April 2016.

[J2] G. Xiaoxu, R.C. DuToit, and K. Bartschat, **"Photoionization of the H_2^+ ion by ultrashort elliptically polarized laser pulses"**, *Physical Review A* 87(5), May 2013

[J1] G. Xiaoxu, E. Secor, R.C. DuToit, and K. Bartschat, **"Diffraction patterns in the ionization of the heteronuclear HeH_2^+ ion by attosecond x-ray radiation"**, *Physical Review A* 86(5), October 2012

Conference Publications

[C5] R.C. DuToit, J.A. Hesche, E.D. Nerurkar, and S.I. Roumeliotis, **"Towards Long Term, Consistent Map-based Localization on Mobile Devices"**, submitted to *International Symposium on Experimental Research (ISER'16)*, Tokyo, Japan, October 3 - 6, 2016.

[C4] R.C. DuToit, J.A. Hesche, E.D. Nerurkar, and S.I. Roumeliotis, **"Consistent Map-based 3D Localization on Mobile Devices"**, submitted to *Robotics: Science and Systems (RSS'16)*, Ann Arbor, MI, June 18 - 22, 2016.

[C3] C.X. Guo, K. Sartipi, R.C. DuToit, G.A. Georgiou, R. Li, J. O'Leary, E.D. Nerurkar, J.A. Hesche, and S.I. Roumeliotis, **"Large-Scale Cooperative 3D Visual-Inertial Mapping in a Manhattan World"**, *IEEE International Conference on Robotics and Automation (ICRA'16)*, Stockholm, Sweden, May 16 - 21, 2016.

[C2] C.X. Guo, D.G. Kottas, R.C. DuToit, A. Ahmed, R. Li, and S.I. Roumeliotis, **"Efficient Visual-Inertial Navigation using a Rolling-Shutter Camera with Inaccurate Timestamps"**, *Robotics: Science and Systems (RSS'14)*, Berkeley, CA, July 12 - 16, 2014.

[C1] D.G. Kottas, R.C. DuToit, A. Ahmed, C.X. Guo, G. Georgiou, R. Li, and S.I. Roumeliotis, **"A Resource-aware Vision-aided Inertial Navigation System for Wearable and Portable Computers"**, *Workshop: Long Term Autonomy, IEEE International Conference on Robotics and Automation (ICRA'14)*, Hong Kong, China, May 31 - June 5, 2014.

Conference Presentations

[P2] C.X. Guo, R.C. DuToit, K. Sartipi, J. O'Leary, E.D. Nerurkar, J.A. Hesche, S.I. Roumeliotis, R. Li, G. Georgios, **"Resource-Aware Large-Scale Cooperative 3D Mapping from Multiple Cell Phones"**, *IEEE International Conference on Robotics and Automation (ICRA'15) Late Breaking Result Poster*, Seattle, WA, May 27 - 29, 2015.

[P1] R.C. DuToit, G. Xiaoxu, and K. Bartschat, **"The Hydrogen Molecular Ion in an Intense Elliptically Polarized XUV Laser Pulse"**, *APS Division of Laser Science, Symposium on Undergraduate Research*, Rochester, NY, October 15, 2012.

Academic Service

Journal Paper Reviewer: IEEE Transactions on Robotics

Conference Paper Reviewer: IEEE International Conference on Robotics and Automation