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*
Created and implemented real-time, vision-inertial localization and mapping algorithms for mobile devices (cell phones, tablets, and wearables). Focus on 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

University of Minnesota, Dept. of CSE: Ph.D. Candidate Travel Award   *2016*

Drake University, Dept. of Physics & Astronomy: Helmick Senior Scholar   *2013*

Drake University, Dept. of Mathematics & CS: Outstanding Student in Computer Science   *2013*

Drake University, Dept. of Physics & Astronomy: Physics Prize Scholarship   *2009 - 2013*

Skills

- C/C++
- Python
- MATLAB
- Linux
- Android
- iOS
- SLAM
- Sensor Fusion
- 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. Hesch, and S.I. Roumeliotis, **"Resource-Aware Large-Scale Cooperative 3D Mapping using Multiple Mobile Devices"**, *IEEE Transactions on Robotics*, submitted.

[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

[C4] R.C. DuToit, J.A. Hesch, E.D. Nerurkar, and S.I. Roumeliotis, **"Consistent Map-based 3D Localization on Mobile Devices"**, *pre-print, arXiv:1604.08087, April 27, 2016.*

[C3] C.X. Guo, K. Sartipi, R.C. DuToit, G.A. Georgiou, R. Li, J. O'Leary, E.D. Nerurkar, J.A. Hesch, 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

[P3] R.C. Dutoit, G. Georgios, C.X. Guo, K. Wu, and S.I. Roumeliotis, **"Vision-Aided Inertial Navigation for Virtual Reality Applications"**, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR'16) Live Demo, Las Vegas, NV, June 27 - 30, 2016.*

[P2] C.X. Guo, R.C. DuToit, K. Sartipi, J. O'leary, , R. Li, G. Georgios, E.D. Nerurkar, J.A. Hesch, S.I. Roumeliotis, **"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

Conference Paper Reviewer: International Symposium on Experimental Robotics