

Jeffrey Kane Johnson

[linkedin.com/in/jeffreykanejohnson](https://www.linkedin.com/in/jeffreykanejohnson)
jeffrey.kane.johnson@pm.me

KEY POINTS	Specialist in motion planning and collision avoidance in multi-agent systems Extensive experience coding for and testing on automated vehicles Years of professional software development experience
WORK HISTORY	<p>Uber ATG, Pittsburgh, PA Jan 2018–Current <i>Senior Autonomy Engineer</i></p> <ul style="list-style-type: none">• Constraint generation for motion planning for urban automated vehicles <p>Maeve Automation May 2017–Current <i>Maintainer</i></p> <ul style="list-style-type: none">• Research in vision-based collision avoidance for mobile navigation• Software engineering consulting• https://maeveautomation.org <p>Apple, Inc., Sunnyvale, CA Jan. 2016–May 2017 <i>Engineer</i></p> <ul style="list-style-type: none">• Experimental algorithm and software development• Build system and code quality maintenance <p>Robert Bosch, LLC, Palo Alto, CA Jan. 2014–Nov. 2015 <i>Research Engineer</i></p> <ul style="list-style-type: none">• Lead development of motion planning/decision making for automated driving• Responsible for track and road testing of vehicle planning algorithms <p>Robert Bosch, LLC, Palo Alto, CA May 2013–Aug. 2013 <i>Intern</i></p> <ul style="list-style-type: none">• Collision detection methods for optimization-based vehicle motion planning <p>TRACLabs, Houston, TX June 2012–Aug. 2012 <i>Intern</i></p> <ul style="list-style-type: none">• Software toolkits for coordinated dual-arm manipulation <p>Indiana University, Bloomington, IN Sept. 2006–Sept. 2009 <i>Web Developer, School of Journalism</i></p> <ul style="list-style-type: none">• Development of school web site and internal web-based applications <p>Contract Developer March 2004–Sept. 2006</p> <ul style="list-style-type: none">• Custom software solutions for small to mid-sized clients
EDUCATION	<p>Indiana University, Bloomington, IN June 2012–Sept. 2017 <i>PhD in Computer Science</i> Concentration: Robotics</p> <p>Indiana University, Bloomington, IN Sept. 2009–June 2012 <i>Master of Science in Computer Science</i></p> <p>Trine University, Angola, IN Aug. 1999–Dec. 2003 <i>Bachelor of Science in Computer Science</i></p>

TOOLING & TRAINING

Programming Languages: Primarily C++, familiar Python, Matlab, & R

Libraries/Environments: ROS, OpenCV, PCL

Version Control: Mercurial, Git

Platforms: Linux (Ubuntu), macOS

Workflow: Certified ScrumMaster 2014–2016 (Scrum Alliance, License 000368544)

Training: Safe Driver Training (Simraceway, Sonoma, CA)

SELECTED PAPERS

Full list of publications available at: <http://jeffreykanejohnson.com>

- *Visual Servoing for Mobile Ground Navigation*, IEEE Connect and Automated Vehicles Symposium (CAVS) 2018
- *On the Relationship Between Dynamics and Complexity in Multi-agent Collision Avoidance*, Autonomous Robots (AURO) 2018
- *Selective Determinism for Autonomous Navigation in Multi-agent Systems*, PhD Dissertation 2017
- *Constant Space Complexity Environment Representation for Vision-based Navigation*, IROS 2017 Workshop on Planning, Perception and Navigation for Intelligent Vehicles
- *A Novel Relationship Between Dynamics and Complexity in Multi-agent Collision Avoidance*, Robotics: Science and Systems (RSS) 2016
- *Identifying Support Surfaces of Climbable Structures from 3D Point Clouds*, ICRA 2014, with Anna Eilering, Victor Yap, & Kris Hauser
- *Optimal Longitudinal Control Planning with Moving Obstacles*, IV 2013, with Kris Hauser
- *Minimizing Driver Interference Under a Probabilistic Safety Constraint in Emergency Collision Avoidance Systems*, ITSC 2012, with Kris Hauser
- *Optimal Acceleration-Bounded Trajectory Planning in Dynamic Environments Along a Specified Path*, ICRA 2012, with Kris Hauser

SELECTED OPEN SOURCE

The following are ROS libraries maintained at:

https://bitbucket.org/maeveautomation/maeve_automation_core/src/

Maeve Dynamics

This package contains a dynamics library for computing reachability under acceleration constraints in a Path-Speed-Time (PST) space.

Maeve Geometry

This package contains a library for manipulating simple geometric types and functions, especially interval sets and quadratic polynomials.

ISP Controller 2D

This package defines a subsumption-based visual servoing controller that computes command messages given input guidance command and ISP fields.

ISP Fields

This package defines a library for handling Image Space Potential (ISP) fields. The fields themselves are represented as plain OpenCV data structures, so all algebraic operations are supplied by that library.

Donkey Car

This stack contains packages for interacting with the [Donkey Car](#) robot platform.