Carl Hildebrandt

Ph.D. Candidate, University of Virginia

85 Engineer's Way
Charlottesville, VA
USA, 22903

hildebrandt.carl@virginia.edu
https://hildebrandt-carl.com

I am interested in the intersection of software analysis and autonomous systems. My primary work focuses on the safety of autonomous systems through the validation and verification of their software.

Education

2018 – **University of Virginia**, USA
Ph.D. Computer Science
Advisor: Dr. Sebastian Elbaum
Lab: LESS (less-lab-uva.github.io)

2013 – 2016 **University of Pretoria**, South Africa
B.Eng. in Computer Engineering

Experience

2018 – Research Assistant, LESS Lab, University of Virginia (less-lab-uva.github.io)

2017 – 2018 Research Assistant, Nimbus Lab, University of Nebraska (nimbus.unl.edu)

2016 – 2017 Software Engineer, Cheesecake Trails, South Africa

Honors & Awards

External

2020 **Distinguished Artifact Award**
Feasible and Stressful Trajectory Generation for Mobile Robots (ISSTA)

2018 **Best Paper Award on Safety, Security, and Rescue Robotics**
Fire-Aware Planning of Aerial Trajectories and Ignitions (IROS)

Internal

2021 **Best Poster Design**
The University of Virginia - Computer Science Research Symposium

2020 **Best Presentation**
The University of Virginia - Computer Science Virtual Research Symposium

Publications

2022 **Carl Hildebrandt**, Meriel von Stein, and Sebastian Elbaum, "Physcov: Physical test coverage for autonomous vehicles," 2022 **(Under Development)**

2022 **Carl Hildebrandt**, Meriel von Stein, Trey Woodlief, and Sebastian Elbaum, "Preparing software engineers to develop robot systems," in *2022 IEEE/ACM 44th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET)*, IEEE, 2022 **(To Appear)**

2021 **Carl Hildebrandt**, and Sebastian Elbaum, "World-in-the-loop simulation for autonomous systems validation," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2021, pp. 10 912–10 919

2020 **Carl Hildebrandt**, Sebastian Elbaum, and Nicola Bezzo, "Blending kinematic and software models for tighter reachability analysis," in *2020 IEEE/ACM 42nd International Conference on Software Engineering: New Ideas and Emerging Results (ICSE-NIER)*, IEEE, 2020, pp. 33–36

2020 **Carl Hildebrandt**, Sebastian Elbaum, Nicola Bezzo, and Matthew B Dwyer, "Feasible and stressful trajectory generation for mobile robots," in *Proceedings of the 29th ACM SIGSOFT International Symposium on Software Testing and Analysis*, 2020, pp. 349–362 **(Distinguished Artifact Award)**

2018 Evan Beachly, Carrick Detweiler, Sebastian Elbaum, Brittany Duncan, **Carl Hildebrandt**, Dirac Twidwell, and Craig Allen, "Fire-aware planning of aerial trajectories and ignitions," in *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2018, pp. 685–692 **(Best Paper Award)**

Patents

2020 **Carl Hildebrandt**, Jefferson Griscavage, Victor Aquino, Melony Bennis, and Tien Comlekoglu, Vuetech Health Innovations LLC, "Systems and Methods for Safety, Security and Well-Being of Individuals", Patent US63066296 **(Under Review)**

Talks

2021 **Carl Hildebrandt** "World-in-the-Loop Simulation for Autonomous Systems Validation", International Conference on Robotics and Automation, May 30th

2020 **Carl Hildebrandt** "Feasible and Stressful Trajectory Generation for Mobile Robots", International Conference on Software Engineering, July 7th

2020 **Carl Hildebrandt** "Blending Kinematic and Software Models for Tighter Reachability Analysis", International Symposium on Software Testing and Analysis, July 21st

Community Service

2022 **Graduate Student Council**, The University of Virginia, Computer Science Department (CSGSG).

2021 **Paper Reviewer**, IEEE International Conference on Robotics and Automation Society (ICRA)

2021 **Student Volunteer**, IEEE/ACM International Conference on Software Engineering (ICSE)

Teaching

2021 Lab Designer and Guest Lecturer, **Robotics for Software Engineers**, The University of Virginia

2020 Lab Designer and Teaching Assistant, **Robotics for Software Engineers**, The University of Virginia

2016 Head Teaching Assistant, **Data Structures and Algorithms in Java**, The University of Pretoria

2015 Head Teaching Assistant, **Program Design in C++**, The University of Pretoria

2015 Teaching Assistant, **Data Structures and Algorithms in Java**, The University of Pretoria

2014 Teaching Assistant, **Introduction to Programming in C**, The University of Pretoria

Achievements

2019 National Club Field Hockey Champions - The University of Virginia

2017 Half Iron Man - South Africa

2017 Comrades Ultra Marathon - South Africa

2016 Summited Kilimanjaro - Tanzania

2012 National u18B Field Hockey Team - South Africa