

# André Platzer

## Education

1999-2004 M.Sc., *summa cum laude*, University of Karlsruhe (TH), Germany Computer Science  
2004-2008 Ph.D., *summa cum laude*, University of Oldenburg, Germany Computer Science

## Appointments

2008–present Professor of Computer Science, Carnegie Mellon University  
Assistant Professor 2008, Associate Professor 2014, Full Professor 2020

## Visiting Positions

1/2019–8/2019 Visiting Professor, Technical University of Munich  
5/2015–8/2015 Visiting Associate Professor, Cornell University

## Awards and Honors

1. Humboldt Research Fellowship 2019, DFG Mercator Fellow
2. NSF CAREER Award, 2011
3. IEEE Intelligent Systems' *AI's 10 to Watch* Award, 2010
4. *Brilliant 10* Award of Popular Science Magazine, 2009
5. ACM Doctoral Dissertation Honorable Mention Award, 2009
6. Best Paper Awards at FM'09, TABLEAUX'07, FM'19

## Select Publications: Foundations

1. **André Platzer** and Yong Kiam Tan. [Differential equation invariance axiomatization](#). *J.ACM*, **67**(1), pp. 6:1–6:66, 2020.
2. **André Platzer**. [Logical Foundations of Cyber-Physical Systems](#). Springer, Cham, 2018. 659 pages. 1.8M downloads. Lecture Videos: <http://video.lfcps.org/>
3. **André Platzer**. [A complete uniform substitution calculus for differential dynamic logic](#). *Journal of Automated Reasoning*, **59**(2), pp. 219-265, 2017.
4. **André Platzer**. [Differential hybrid games](#). *ACM Trans. Comput. Log.*, **18**(3), pp. 19:1–19:44, 2017.
5. **André Platzer**. [Differential game logic](#). *ACM Trans. Comput. Log.*, **17**(1), pp. 1:1–1:52, 2015.
6. **André Platzer**. [The complete proof theory of hybrid systems](#). *ACM/IEEE Symposium on Logic in Computer Science, LICS 2012, June 25–28, 2012, Dubrovnik, Croatia*, pp. 541-550. IEEE, 2012.
7. **André Platzer**. [Logical Analysis of Hybrid Systems: Proving Theorems for Complex Dynamics](#). Springer, Heidelberg, 2010. 426 pages.

## Select Publications: Tools

1. Andrew Sogokon, Stefan Mitsch, Yong Kiam Tan, Katherine Cordwell and **André Platzer**. [Pegasus: Sound continuous invariant generation](#). *Formal Methods in System Design*.
2. Nathan Fulton, Stefan Mitsch, Jan-David Quesel, Marcus Völpl and **André Platzer**. [KeYmaera X: An aXiomatic tactical theorem prover for hybrid systems](#). In Amy P. Felty and Aart Middeldorp, editors, *International Conference on Automated Deduction, CADE-25, Berlin, Germany, Proceedings*, volume 9195 of LNCS, pp. 527–538. Springer, 2015.
3. **André Platzer** and Jan-David Quesel. [KeYmaera: A hybrid theorem prover for hybrid systems](#). In Alessandro Armando, Peter Baumgartner, and Gilles Dowek, editors, *Automated Reasoning, Third International Joint Conference, IJCAR'08, Sydney, Australia, Proceedings*, volume 5195 of LNCS, pp. 171–178. Springer, 2008.

## Select Publications: Applications

1. Stefan Mitsch, Khalil Ghorbal, David Vogelbacher and **André Platzer**. [Formal verification of obstacle avoidance and navigation of ground robots](#). *International Journal of Robotics Research*. **36**(12), pp. 1312-1340, 2017.
2. Jean-Baptiste Jeannin, Khalil Ghorbal, Yanni Kouskoulas, Aurora Schmidt, Ryan Gardner, Stefan Mitsch and **André Platzer**. [A formally verified hybrid system for safe advisories in the next-generation airborne collision avoidance system](#). *STTT*, **19**(6), pp. 717-741, 2017.
3. Yanni Kouskoulas, David W. Renshaw, **André Platzer** and Peter Kazanzides. [Certifying the safe design of a virtual fixture control algorithm for a surgical robot](#). In Calin Belta and Franjo Ivancic, editors, *Hybrid Systems: Computation and Control, HSCC'13, Philadelphia, PA, USA, April 8-13, 2013*, pp. 263-272. ACM, 2013.

## Synergistic Activities

1. Developed new undergraduate course *Logical Foundations of Cyber-Physical Systems*, textbook, videos, labs, theory homework, and autogradable active learning quizzes. Taught at CMU, ENS Lyon, France, and at University of Minho, Portugal.
2. Found bugs in aircraft collision avoidance systems and maneuvers and developed and verified corrected collision avoidance controllers, including  $\approx 900$  million counterexamples for the FAA's next-generation Airborne Collision Avoidance System ACAS X. Found and fixed bugs in surgical robotics system. Verified dynamic window algorithm for obstacle avoidance in mobile robots.
3. ScienceNews for Kids, Machine Intelligence Research Institute, Robotics Business Review, and JFK 50 Legacy Gallery by the John F. Kennedy Presidential Library and Museum.

## Conferences

IJCAR, CADE, HSCC, FM, LICS, TACAS, ICCPS