Jean-Baptiste Jeannin
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Education

PhD, 08/2013, Computer Science, Cornell University, Ithaca, NY, United States of America
Title of Dissertation: Capsules and Non-Well-Founded Computation
Advisor: Dexter Kozen

MS, 08/2012, Computer Science, Cornell University, Ithaca, NY, United States of America

BSE, 09/2007, Mathematics and Computer Science, Ecole polytechnique, Palaiseau, France

Appointments

Positions at U of M

1. Assistant Professor, Aerospace Engineering, University of Michigan, Ann Arbor, MI, 09/2017 - 05/2021

Positions at other institutions or organizations

1. Senior Researcher, Programming Languages Group, Samsung Research America, Mountain View, CA, United States of America, 09/2015 - 08/2017

2. Postdoctoral Scholar, Computer Science Department, Carnegie Mellon University, Pittsburgh, PA, United States of America, 09/2013 - 08/2015

Honors and Awards

Institutional

1. Acheson Award: merit-based full-tuition scholarship for Master program at Cornell University, 08/2007

Teaching

New courses introduced at U of M

1. AERO 350 (formerly AERO 495), Fundamentals of Aerospace Computing
   Description: The class is envisioned as a junior-level undergraduate class. Its first six weeks focus on fundamentals: programming and logic, data structures, introduction to complexity theory and algorithms. The next four weeks use those tools to introduce students to computational science, showing them how to simulate differential equation solutions using finite different schemes. The last four weeks focus on embedded systems for aerospace, including sensor interfaces, signal processing and embedded control.
   Objective: The class was introduced as a response to feedback from the aerospace industry and the department's advisory board, that our students did not have adequate computing training for the challenges of aerospace engineering in the twenty-first century.

Courses taught at U of M

Course #	Course Title	Teaching Role	Term	Enrollment/Response
AERO 350	Fundamentals of Aerospace Computing	Instructor	Fall 2021	Evaluations not available yet
AERO 552	Aerospace Information Systems	Instructor	Winter 2021	27/31
AERO 495	Fundamentals of Aerospace Computing	Instructor	Winter 2020	18/24
EECS 590	Advanced Programming Languages	Instructor	Winter 2020	32/33
AERO 495	Fundamentals of Aerospace Engineering	Co-Instructor	Fall 2019	27/13
AERO 552	Aerospace Information Systems	Instructor	Winter 2019	32/11
AERO 495	Fundamentals of Aerospace Engineering	Co-Instructor	Fall 2018	7/3
AERO 552	Aerospace Information Systems	Instructor	Fall 2017	26/21

Course #	Term	Enrollment/Response	Q1	Q1631	Q1632	Q1633	Course Quality Avg. (Q1631, Q1632, Q1633)	Q2	Q199	Q217	Q230	Instructor Quality Avg. (Q199, Q217, Q230)	Q4	Q891
AERO 350	Fall 2021	Evaluations not available yet												
AERO 552	Winter 2021	27/31	3.7	4.2	4.0	4.0	4.07	4.1	4.3	4.8	4.3	4.47	3.9	2.9
AERO 495	Winter 2020	18/24	4.2	4.4	4.2	4.0	4.20	4.4	4.2	4.7	4.6	4.50	3.8	2.6
EECS 590	Winter 2020	32/33	4.4	4.8	4.4	4.4	4.53	4.8	4.7	4.9	4.7	4.77	4.3	2.6
AERO 495	Fall 2019	27/13	3.9	4.6	4.0	3.8	4.13	4.7	4.7	4.9	4.8	4.80	4.6	2.4
AERO 552	Winter 2019	32/11	3.9	4.3	4.1	3.6	4.00	4.0	4.6	4.8	4.3	4.57	4.3	2.9
AERO 495	Fall 2018	7/3	4.8	4.8	4.3	4.0	4.37	4.8	4.8	5.0	4.8	4.87	4.0	2.0
AERO 552	Fall 2017	26/21	4.36	4.55	4.69	4.15	4.46	4.33	4.55	4.80	4.80	4.72	4.38	2.57

Evaluations are on a 5 point scale where 5 is Strongly Agree and 1 is Strongly Disagree.
Q1. This was an excellent course.
Q1631. This course advanced my understanding of the subject matter.
Q1632. My interest in the subject has increased because of this course.
Q1633. I knew what was expected of me in this course.
Q2. The instructor was an excellent teacher.
Q199. The instructor explained material clearly.
Q217. The instructor treated students with respect.
Q230. The instructor seemed well prepared for class meetings.
Q4. I had a strong desire to take this course.
Q891. As compared with other courses of equal credit, the workload for this course was (5 = Much Lighter, 4 = Lighter, 3 = Typical, 2 = Heavier, 1 = Much Heavier).

Ph.D. committee activity (chair)

1. Nishant Ketherpal, 2025, Geometric Formal Verification via Active Corners (Robotics)

2. Jiawei Chen, 2025, Synchronous Programming with Differential Equations and Dependent Types (Robotics)

3. Hammad Ahmad, 2024, Program Repair in Formal Verification (Computer Science and Engineering).
   Student Current Position: Graduate Student

4. Mohit Tekriwal, 2023, Formal Verification of Numerical Schemes (Aerospace Engineering).
   Student Current Position: Graduate Student

5. Shayan Jalili, 2021, Graduated with a Masters in 2021.
   Student Current Position: Graduate Student

Ph.D. committee activity (member)

1. Prashin Sharma, 2022

2. Haojun Ma, 2022

3. Claire Wincott, 2021

4. James Usevitch, 2021

5. Andrew Quinn, 2021

6. Mark Gallagher, 2021

7. Kevin Angstadt, 2020

8. Romulo Meira Goes, 2020

9. Yiding Ji, 2019

10. Xianzheng Dou, 2019

11. Ofir Weisse, 2019

12. Misiker Tadesse Aga, 2019

13. Zelalem Birhanu Aweke, 2018

M.S. students advised

1. Hang Zhang, 2020 - 2022, Comparison of forward and backward reachability for zonotopes and Hamilton-Jacobi-Bellman equations

2. Ke Du, 2020, Formal Verification of a Taxiway Path-Finding Algorithm

3. Siyuan He, 2020, Formal Verification of a Taxiway Path-Finding Algorithm

4. Jiahong Xu, 2020, Falsification of Vision-based Automatic Landing

5. Joshua Whilhelm, 2019 - 2020, Verification of Self-Taxiing

6. Yuhao Zhang, 2018 - 2020, Verification of Self-Taxiing

7. Aakash Abhishek, 2018 - 2019, Verification of Swerving and Braking Maneuvers

8. Huaiyuan Teng, 2018 - 2019, Verification of Self-Taxiing

9. Guillaume Poupart-Lafarge, 2018 - 2018, Taxiing path planning

10. Enoch Lee, 2018 - 2018

Co-Advised

1. Yuhao Zhang, 2018 - 2020, Formal verification of aircraft taxiing

2. Huaiyuan Teng, 2018 - 2019, Formal verification of aircraft taxiing

Undergraduate students advised

1. Elanor Tang, 2021 - 2022, Geometric safety proofs

2. Avi Tachna-Fram, 2021 - 2022, Formal Verification of MSR Algorithm

3. José Luiz Vargas de Mendonça, 2020 - 2022, Verification of Synchronous Hybrid Systems

4. Harsh Jhaveri, 2020, Runtime Verification on UAVs

5. Bethel Hall, 2020, Correct-by-construction Neural Networks (AURA program)

6. Isabelle Gallagher, 2020, Falsification of Vision-based Automatic Landing

7. Joshua Miller, 2020, Verification of Numerical Schemes

8. Eytan Adler, 2019 - 2019, Formal Verification of Aicraft Turning Maneuvers

9. Harry Sood, 2018 - 2020, Formal Verification of Car Emergency Maneuvers

10. Shivam Sharma, 2018 - 2020, Formal Verification of Neural-Network-based Aircraft Collision Avoidance

11. Nathan Vollbrecht, 2018 - 2018, Verification of Control Algorithms

12. Nathan Koskas de Diego, 2018 - 2018, Verification of Control Algorithms

Research

Research programs underway

1. **Verification of Cyber-Physical Systems**
   Verification of Cyber-Physical Systems has historically been tackled by two separate communities, the controls community, and the logics and programming languages community. I come from the latter, but other faculty in my department, as well as Necmiye Ozay from ECE, come from the former. I have been working on understanding the controls point of view of the problem, and integrate logic-based reasoning with techniques traditionally used in controls.

2. **Formal Verification of Computational Schemes**
   Computational schemes -- such as finite differences and finite elements -- are traditionally used to model the behavior of differential equations to make important engineering decisions.
   Because computational schemes are software, they could contain software bugs that could lead to wrong engineering decisions.
   We have started using the Coq theorem prover to fully prove finite different schemes, including consistency, stability and convergence, in an interactive theorem prover. This is ongoing work that we plan to submit to a conference in 2020.
   Going forward we want to tackle more complicated schemes, and use lighter program analysis tools to detect bugs in computational schemes with less human effort.

3. **Formal Verification of Distributed Systems**
   One of the most challenging parts of verifying distributed sytems is to find an inductive invariant. In our HotOS 2019 and SOSP 2019 papers, we present a new approach, Incremental Inference of Inductive Invariants (I4), to automatically generate inductive invariants for distributed protocols. The essence of our idea is simple: the inductive invariant of a finite instance of the protocol can be used to infer a general inductive invariant for the infinite distributed protocol.
   In I4, we use a model checking tool to automatically derive the inductive invariant for a finite instance of the protocol; and generalize this invariant to an inductive invariant for the infinite protocol. Our experiments show that I4 can prove the correctness of several distributed protocols like Chord, 2PC and Transaction Chains with little to no human effort.

Past grants and contracts
1. *Collins Aerospace*, "Formal verification for autonomous aerospace systems," 01/2020 - 12/2020, Total: 129,974, Jean-Baptiste Jeannin (PI), Necmiye Ozay (Co-PI). Candidate's Share: 64,987.
2. *Collins Aerospace*, "Formal verification for autonomous aerospace systems," 03/2019 - 12/2019, Total: 59,827, Necmiye Ozay (PI), Jean-Baptiste Jeannin (Co-PI). Candidate's Share: 29,914.
3. *Toyota Research Insitute*, "Formally Verified Guardians to Avoid Moving Obstacles," 01/2019 - 04/2021, Total: 228,613, Jean-Baptiste Jeannin (PI). Candidate's Share: 228,613.
4. *Collins Aerospace*, "Formal Verification for Autonomous Aerospace Systems," 08/2018 - 12/2018, Total: 24,784, Jean-Baptiste Jeannin (Co-PI). Candidate's Share: 12,392.
5. *Toyota Research Institute*, "Formally Verified Guardians for Enhanced Driving: Emergency Braking, Swerving, and Combined Maneuvers," 01/2018 - 08/2019, Total: 170,712, Jean-Baptiste Jeannin (PI). Candidate's Share: 170,712.

Current grants and contracts
1. *NASA Fellowship*, "Compositional Reasoning and Parallelism in Cyber-Physical Systems," 09/2020 - 08/2023, Total: 165,000, Jean-Baptiste Jeannin (PI), Shayan Jalili (Co-I). Candidate's Share: 165,000.

Pending grants and contracts
1. *[Pending] Amazon*, "Automatic Verification of Distributed Systems Implementations," 10/2021, Total: 100,000, Jean-Baptiste Jeannin (PI). Candidate's Share: 100,000.

2. *[REJECTED] NASA ULI Step A* , "Assured Fault Tolerance and Anomaly Mitigation in Joint Human/Machine Decision-Making," 07/2021, Total: 4.5 million, Peter Seiler (PI), Mark Everly (Co-PI), Chinwendu Enyioha (Co-PI), Alex Gorodetsky (Co-PI), Jean-Baptiste Jeannin (Co-PI), Necmiye Ozay (Co-PI), Kristin Yvonne Rozier (Co-PI), Julie Shah (Co-PI), Jessie Yang (Co-PI). Candidate's Share: 500k.
3. *[REJECTED] Amazon* , "End-to-end Formal Verification of Controllers for Package Delivery," 04/2021, Total: 100000, Jean-Baptiste Jeannin (PI). Candidate's Share: 100000.
4. *[REJECTED] NSF* , "CAREER: A Programming Language for the Verification, Execution And Simulation of Cyber-Physical Systems," 08/2020, Total: 510,000, Jean-Baptiste Jeannin (PI). Candidate's Share: 510,000.
5. *[REJECTED] AFOSR YIP* , "CoCoNets: Designing Provably Safe Machine-Learning-based Hybrid Systems," 07/2020, Total: 450,000, Jean-Baptiste Jeannin (PI). Candidate's Share: 450,000.
6. *[REJECTED] NSF* , "CPS: Medium: End-to-end Formal Verification of Control Algorithms," 06/2020, Total: 1,199,993, Jean-Baptiste Jeannin (PI), Tulga Ersal (Co-PI). Candidate's Share: 600,000.
7. *[REJECTED] NASA ULI Step A* , "Holistic Advanced Air Mobility Safety Assurance Technologies (HAAM-SAT)," 06/2020, Total: 6,100,000, Ella Atkins (PI), Nadine Sarter (Co-PI), Ily Kolmanovsky (Co-PI), Jean-Baptiste Jeannin (Co-PI), Gautam Biswas (Co-PI), Sankaran Mahadevan (Co-PI), Abhishek Dubey (Co-PI), Taylor Johnson (Co-PI), Yu Gu (Co-PI), Jason Gross (Co-PI), Peng Wei (Co-PI), Amir Shirkhodaie (Co-PI), Eddie Red (Co-PI). Candidate's Share: 500,000.
8. *[REJECTED] Boeing* , "Intelligent Advisor for Vehicle Design MDAO," 05/2020, Total: 100,000, Joaquim Martins (PI), Jean-Baptiste Jeannin (Co-PI). Candidate's Share: 50,000.
9. *[REJECTED] Toyota Research Institute (pre-proposal)* , "Formal Verification of MPC implementations for car collision avoidance," 01/2020, Total: TBD, Jean-Baptiste Jeannin (PI), Tulga Ersal (Co-PI), Gabor Orosz (Co-PI). Candidate's Share: TBD.
10. *[REJECTED] Toyota Research Institute (pre-proposal)* , "Automated consistency checking and compositional verification for autonomous systems," 01/2020, Total: TBD, Jean-Baptiste Jeannin (PI), Eunsuk Kang (Co-PI). Candidate's Share: TBD.
11. *[REJECTED] NSF* , "SHF: Medium: Automated Verification of Distributed Protocols by Symmetry Reduction & Action Space Abstraction," 09/2019, Total: 1,200,000, Karem Sakallah (PI), Jean-Baptiste Jeannin (Co-PI). Candidate's Share: 550,000.
12. *[REJECTED] NSF* , "CPS: Frontier: Collaborative Research: Cyber-Physical Systems for Safe Urban Air Mobility," 09/2019, Total: 3,953,718, Ella Atkins (PI), Jean-Baptiste Jeannin (Co-PI), Baris Kasikci (Co-PI), Alex Gorodetsky (Co-PI), Nadine Sarter (Co-PI), Yan Wan (Co-PI), Frank Lewis (Co-PI), Nicholas Gans (Co-PI), Eric Frew (Co-PI), Morteza Lahijanian (Co-PI). Candidate's Share: 400,000.
13. *[REJECTED] NSF* , "CAREER: A Programming Language for the Verification, Execution And Simulation of Cyber-Physical Systems," 07/2019, Total: 510,000, Jean-Baptiste Jeannin (PI). Candidate's Share: 510,000.
14. *[REJECTED] NASA* , "Analysis and Verification of Increasingly Autonomous Teams for Emergencies (AVIATE)," 07/2019, Total: 900,000, Ella Atkins (PI), Jean-Baptiste Jeannin (Co-PI), Nadine Sarter (Co-PI). Candidate's Share: 300,000.
15. *[REJECTED] NSF* , "CNS Core: Medium: I4: Incremental Inference of Inductive Invariants for Distributed Systems," 10/2018, Total: 1,200,000, Manos Kapritsos (PI), Jean-Baptiste Jeannin (Co-PI), Baris Kasikci (Co-PI), Karem Sakallah (Co-PI). Candidate's Share: 300,000.
16. *[REJECTED] NSF* , "CPS: Frontier: Collaborative Research: Cyber-Physical Foundations for Safe Urban Air Mobility," 08/2018, Total: 3,547,093, Ella Atkins (PI), Alex Gorodetsky (Co-PI), Jean-Baptiste Jeannin (Co-PI), Baris Kasikci (Co-PI), Nadine Sarter (Co-PI). Candidate's Share: 400,000.
17. *[REJECTED] Ford (pre-proposal)* , "Computationally-efficient mathematical representation of traffic rules," 06/2018, Total: TBD, Jean-Baptiste Jeannin (PI). Candidate's Share: TBD.
18. *[REJECTED] NSF* , "FMitF: Collaborative Research: End-to-end Formal Verification of Machine-Learning-based Cyber-Physical Systems," 05/2018, Total: 600,000, Jean-Baptiste Jeannin (PI), Clark Barrett (Co-PI), Mykel Kochenderfer (Co-PI). Candidate's Share: 350,000.
19. *[REJECTED] DARPA Assured Autonomy* , "Invariant-Based Assurance for Learning Autonomy (IBALA)," 10/2017, Total: 6,000,000, Eric Feron (PI), Balakirsky (Co-PI), Calin Belta (Co-PI), Boots (Co-PI), Coogan (Co-PI), De Marco (Co-PI), Egerstedt (Co-PI), John Hauser (Co-PI), Jean-Baptiste Jeannin (Co-PI), Theodorou (Co-PI), Reg (Co-PI), Nate Foster (Co-PI), Dexter Kozen (Co-PI), Vela (Co-PI), Weiss (Co-PI), Zsolt (Co-PI). Candidate's Share: 519,794.

Publications and Scholarly Presentations

Full articles in refereed journals, transactions, or archives

1. **Jean-Baptiste Jeannin**, Khalil Ghorbal, Yanni Kouskoulas, Ryan Gardner, Aurora Schmidt, Stefan Mitsch, André Platzer "A Formally Verified Hybrid System for Safe Ad- visories in the Next-Generation Airborne Collision Avoidance System". *International Journal on Software Tools for Technology Transfer (STTT)*. 2017

2. **Jean-Baptiste Jeannin**, Dexter Kozen, Alexandra Silva "CoCaml: Programming with coinductive types". *Fundamenta Informaticae (FI)*. 2017

3. **Jean-Baptiste Jeannin**, Dexter Kozen, Alexandra Silva "Well-Founded Coalgebras, Revisited". *Mathematical Structures in Computer Science (MSCS)*. 2016

4. Khalil Ghorbal, **Jean-Baptiste Jeannin**, Erik Zawadzki, André Platzer, Geoffrey J. Gordon, Peter Capell "Hybrid Theorem Proving of Aerospace Systems: Applications and Challenges". *Journal of Aerospace Information Systems (JAIS)* . 2014; 11: 702-713

5. **Jean-Baptiste Jeannin**, Dexter Kozen "Computing with Capsules". *Journal of Automata, Languages and Combinatorics (JALC)* . 2012; 17: 185–204

Refereed conference or symposium proceedings papers

1. Shibo Chen, Yonathan Fisseha, **Jean-Baptiste Jeannin**, Todd Austin "Twine: A Hardware Design Language for Component-Level Heterogeneous Design". *Design, Automation and Test in Europe Conference* , Antwerp, Belgium, 03/2022

2. Hammad Ahmad, **Jean-Baptiste Jeannin** "A Program Logic to Verify Signal Temporal Logic Specifications of Hybrid Systems". *Hybrid Systems: Computation and Control*, Online, MI, United States of America, 05/2021, (Journal Quality), Accepted, in press

3. Hossein Rastgoftar, **Jean-Baptiste Jeannin** "A Physics-Based Finite-State Abstraction for Traffic Congestion Control". *American Control Conference (ACC)*, New Orleans, LA, United States of America, 05/2021, Accepted, in press

4. Mohit Tekriwal, Karthik Duraisamy, **Jean-Baptiste Jeannin** "A formal proof of the Lax equivalence theorem for finite difference schemes". *NASA Formal Methods (NFM)*, Online, CA, United States of America, 05/2021, (Journal Quality), Accepted, in press

5. <u>Yuhao Zhang</u>, <u>Sara Shoouri</u>, <u>Joshua Wilhelm</u>, <u>Shayan Jalili</u>, <u>Jiahong Xu</u>, **Jean-Baptiste Jeannin**, Necmiye Ozay "Falsification of Vision-based Automatic Landing". *AIAA SciTech*, 2021

6. Kevin Angstadt, **Jean-Baptiste Jeannin**, Westley Weimer "Accelerating Legacy String Kernels via Bounded Automata Learning". *Architectural Support for Programming Languages and Operating Systems (ASPLOS). Acceptance rate: 18% (86/486)*, 2020, (Journal Quality), Accepted, in press

7. <u>Aakash Abhishek</u>, <u>Harry Sood</u>*, **Jean-Baptiste Jeannin** "Formal Verification of Braking while Swerving in Automobiles". *Hybrid Systems: Computation and Control (HSCC). Acceptance rate: 39% (29/75)*, 2020, (Journal Quality), Accepted, in press

8. <u>Siyuan He</u>, <u>Ke Du</u>*, <u>Joshua Wilhelm</u>, **Jean-Baptiste Jeannin** "Verification of an Airport Taxiway Path-Finding Algorithm". *Digital Avionics Systems Conference (DASC), to appear*, Virtual, 2020, Accepted, in press

9. <u>Aakash Abhishek</u>, <u>Harry Sood</u>*, **Jean-Baptiste Jeannin** "Formal Verification of Swerving Maneuvers for Car Collision Avoidance". *American Control Conference (ACC)*, 2020, Accepted, in press

10. <u>Yuhao Zhang</u>, <u>Guillaume Poupart-Lafarge</u>, <u>Huaiyuan Teng</u>, <u>Joshua Wilhelm</u>, **Jean-Baptiste Jeannin**, Necmiye Ozay, Eelco Scholte "A Software Architecture for Autonomous Taxiing of Aircraft". *AIAA SciTech*, 2020

11. Hossein Rastgoftar, **Jean-Baptiste Jeannin**, Ella Atkins "An integrative behavioral-based physics-inspired approach to traffic congestion control". *Dynamics Systems and Control Conference (DSCC)*, 2020, Accepted, in press

12. Yanni Kouskoulas, Aurora Schmidt, **Jean-Baptiste Jeannin**, Daniel Genin, Jessica Lopez "Provably Safe Controller Synthesis Using Safety Proofs as Building Blocks". *International Conference on Software Engineering Research and Innovation (CONISOFT)*, 2019

13. Haojun Ma, Aman Goel, **Jean-Baptiste Jeannin**, Manos Kapritsos, Baris Kasikci, Karem A. Sakallah "I4: Incremental Inference of Inductive Invariants for Verification of Distributed Protocols". *Symposium on Operating Systems Principles (SOSP). Acceptance rate: 14% (38/276)*, 2019, (Journal Quality)

14. **Jean-Baptiste Jeannin** "Programming with Rational Coinductive Streams". *Workshop on ML-family Programming Languages (ML)*, 2019, Accepted, in press

15. Hossein Rastgoftar, **Jean-Baptiste Jeannin**, Ella M. Atkins "Formal Specification of Continuum Deformation Coordination". *American Control Conference (ACC)*, 2019, Accepted, in press

16. <u>Eytan Adler</u>*, **Jean-Baptiste Jeannin** "Formal Verification of Collision Avoidance for Turning Maneuvers in UAVs". *AIAA Aviation*, 2019, Accepted, in press

17. Haojun Ma, Aman Goel, Jean-Baptiste Jeannin, Manos Kapritsos, Baris Kasikci, Karem A. Sakallah "Towards Automatic Inference of Inductive Invariants". *Workshop on Hot Topics in Operating Systems (HotOS)*, 2019, Accepted, in press

18. Kyle D. Julian, <u>Shivam Sharma</u>*, **Jean-Baptiste Jeannin**, **Mykel J. Kochenderfer** "Verifying Aircraft Collision Avoidance Neural Networks Through Linear Approximations of Safe Regions". *Verification of Neural Networks (VNN)*, 2019, Accepted, in press

19. Leonid Ryzhyk, Nikolaj Bjørner, Marco Canini, **Jean-Baptiste Jeannin**, Cole Schlesinger, Douglas B. Terry, George Varghese "Correct by Construction Networks using Stepwise Refinement". *USENIX Symposium on Networked Systems Design and Implementation (NSDI). Acceptance rate: 18% (46/254)*, 2017, (Journal Quality)

20. Arjun Guha, **Jean-Baptiste Jeannin**, Rachit Nigam, Rian Shambaugh, Jane Tangen "Fission: Dynamic Code Splitting for Javascript". *Summit on Advances in Programming Languages (SNAPL). Acceptance rate: 64% (18/28)*, 2017

21. Andrei Marian Dan, Manu Sridharan, Satish Chandra, **Jean-Baptiste Jeannin**, Martin T. Vechev "Finding Fix Locations for CFL-Reachability Analyses via Minimum Cuts". *Computer-Aided Verification (CAV). Acceptance rate: 30% (57/191)*, 2017, (Journal Quality)

22. Yanni Kouskoulas, Daniel Genin, Aurora Schmidt, **Jean-Baptiste Jeannin** "Formally Verified Safe Vertical Maneuvers for Non-Deterministic, Accelerating Aircraft Dynamics". *Interactive Theorem Proving (ITP). Acceptance rate: 46% (30/65)*, 2017, (Journal Quality)

23. Julie L. Newcomb, Satish Chandra, **Jean-Baptiste Jeannin**, Cole Schlesinger, Manu Sridharan "IoTa: A Calculus for Internet of Things Automation". *Onward!, part of Systems, Programming, Languages and Applications: Software for Humanity (SPLASH). Acceptance rate: 50% (15/30)*, 2017

24. Satish Chandra, Colin Gordon, **Jean-Baptiste Jeannin**, Cole Schlesinger, Manu Sridharan, Frank Tip, Young-il Choi "Type Inference for Static Compilation of JavaScript". *Object-Oriented Programming, Systems, Languages and Applications (OOPSLA). Acceptance rate: 26% (52/203)*, 2016, (Journal Quality)

25. **Jean-Baptiste Jeannin**, Khalil Ghorbal, Yanni Kouskoulas, Ryan Gardner, Aurora Schmidt, Erik Zawadzki, André Platzer "A Formally Verified Hybrid System for the Next-Generation Airborne Collision Avoidance System". *Tools and Algorithms for the Construction and Analysis of Systems (TACAS). Acceptance rate: 24% (36/147)*, 2015, (Journal Quality)

26. **Jean-Baptiste Jeannin**, Khalil Ghorbal, Yanni Kouskoulas, Ryan Gardner, Aurora Schmidt, Erik Zawadzki, André Platzer "Formal Verification of ACAS X, an Industrial Airborne Collision Avoidance System". *Embedded Software (EMSOFT). Invited paper*, 2015, (Journal Quality)

27. Carolyn Jane Anderson, Nate Foster, Arjun Guha, **Jean-Baptiste Jeannin**, Dexter Kozen, Cole Schlesinger, David Walker "NetKAT: Semantic Foundations for Networks". *Principles of Programming Languages (POPL). Acceptance rate: 23% (51/220)* , 2014, (Journal Quality)

28. **Jean-Baptiste Jeannin**, André Platzer "dTL2: Differential Temporal Dynamic Logic with Nested Modalities for Hybrid Systems". *International Conference on Automated Rea- soning (IJCAR). Acceptance rate: 45% (37/83)*, 2014, (Journal Quality)

29. **Jean-Baptiste Jeannin**, Guido de Caso, Juan Chen, Yuri Gurevich, Prasad Naldurg, Nikhil Swamy "DKAL*: Constructing Executable Specifications of Authorization Protocols". *Engineering Secure Software and Systems (ESSoS). Acceptance rate: 24% (15/62)* , 2013

30. **Jean-Baptiste Jeannin**, Dexter Kozen, Alexandra Silva "Language Constructs for Non-Well-Founded Computation". *22nd European Symposium on Programming (ESOP). Acceptance rate: 26% (31/120)*, 2013

31. **Jean-Baptiste Jeannin**, Dexter Kozen "Capsules and Separation". *Logic in Computer Science (LICS). Acceptance rate: 35% (60/171)* , 2012, (Journal Quality)

32. **Jean-Baptiste Jeannin**, Dexter Kozen "Computing with Capsules". *Descriptional Complexity of Formal Systems (DCFS). Invited paper.* , 2012

33. **Jean-Baptiste Jeannin** "Capsules and Closures: a Small-Step Approach". *ogic and Program Semantics: Essays dedicated to Dexter Kozen on the the occasion of his 60th birthday*, 2012, Accepted, in press

34. **Jean-Baptiste Jeannin** "Capsules and Closures". *Mathematical Foundations of Programming Semantics (MFPS XXVII). Acceptance rate: 70% (14/20)*, 2011

35. Heber Herencia-Zapana, **Jean-Baptiste Jeannin**, César Muñoz "Formal Verification of Safety Buffers for State-Based Conflict Detection and Resolution". *27th International Congress of the Aeronautical Sciences (ICAS)* , 2010

Book reviews

1. **Jean-Baptiste Jeannin**, "Formal Verification of Control System Software", Pierre-Loic Garoche, 2018

Other submitted publications

1. <u>Nishant Kheterpal</u>, <u>Elanor Tang</u>*, "Automating geometric proofs of collision avoidance via active corners", *submitted to Submitted to TACAS 2022*, 10/2021

2. Mohit Tekriwal, Jean-Baptiste Jeannin, "Formal verification of iterative convergence for numerical solutions of differential equations", *submitted to Submitted to CPP 2022*, 09/2021

3. Haojun Ma, <u>Hammad Ahmad</u>, Aman Goel, Eli Goldweber, **Jean-Baptiste Jeannin**, Manos Kapritsos, Baris Kasikci, "Sift: Using Refinement-guided Automation to Verify Complex Distributed Systems", *submitted to Submitted to NSDI 2022* , 09/2021

Invited presentations (10 salient)

1. "Temporal reasoning and aircraft collision avoidance", United Technologies Research Center seminar, Berkeley, CA, 01/2020

2. "Temporal reasoning and aircraft collision avoidance", United Technologies Research Center seminar, Farmington, CT, 11/2019

3. "Collision avoidance and path replanning of individual farm robots", Dagstuhl seminar, Dagstuhl, Germany, 10/2019

4. "Programming with Rational Coinductive Types", MidWest Programming Languages Seminar, Purdue University, 09/2019

5. "Temporal reasoning and aircraft collision avoidance", JHU/APL seminar, Bethel, MD, 08/2019

6. "Temporal reasoning and aircraft collision avoidance", Cambridge University seminar, Cambridge, UK, 06/2019

7. "Temporal reasoning and aircraft collision avoidance", Dynamical Systems Workshop, Moorea, 06/2019

8. "Verifying Neural Networks forAircraft Collision Avoidance", CPS Verification and Validation workshop, Carnegie Mellon University, Pittsburgh, PA, 12/2018

9. "Formal Verification of ACAS X", NASA Langley seminar, Langley, VA, 11/2018

10. "Temporal reasoning and aircraft collision avoidance", INRIA Rennes seminar, Rennes, France, 08/2018

Service

Significant service assignments

Department

1. member, Undergraduate Committee, 01/2021

2. member, DEI committee, 09/2019 - 2021

3. member, Graduate committee, 10/2018 - 2021

4. member, Aerospace Computing Curriculum Committee, 09/2017 - 2018

Service to government or professional organizations, and service on review board/study panels

1. PC Member, CAV 2022, 2022

2. PC Member, HSCC 2022, 2022

3. PC Member, CSL 2021, 2021

4. PC Member, CAV 2021, 2021

5. PC Member, HSCC 2020, 2020

6. PC Member, RAMiCS 2020, 2020

7. PC Member, ICCPS 2020, 2020

8. PC Member, NFM 2020, 2020

9. PC Member, EMSOFT 2020, 2020

10. PC Member, HSCC 2019, 2019

11. PC Member, ITP 2019, 2019

12. PC Member, FoMLAS 2019, 2019

13. PC Member, EMSOFT 2019, 2019

14. PC Member, FoMLAS 2020, 2019

15. PC Member, RAMiCS 2018, 2018

16. PC Member, RAMiCS 2017, 2017

17. PC Member, ICE 2015, 2015

Contribution to diversity, equity, and inclusion

1. Co-organization the Verification Mentoring Workshop (VMW), a workshop for students co-located with the 2020 CAV conference (held online due to Covid)

2. Co-organization the 2020 Midwest Programming Languages Workshop (MWPLS) (delayed to 2022 due to Covid)

3. Co-chair of the Verification Mentoring Workshop (VMW), a workshop for students co-located with the 2021 CAV conference (held online due to Covid)