

Caio Batista de Melo

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Education

University of California, Irvine

Ph.D. in Computer Science

Dissertation: Reasoning About Emergent Behaviors at Runtime

Advised by Prof. Nikil Dutt

Irvine, CA

Sep. 2018 – Jun. 2023

University of Brasília

M.Sc. in Computer Science

Thesis: Characterization of Implied Scenarios as Families of Common Behavior

Advised by Prof. Genaína Rodrigues

Brasília, Brazil

Aug. 2017 – Aug. 2018

University of Brasília

B.Sc. in Computer Science

Brasília, Brazil

Mar. 2012 – Jul. 2017

Fordham University

Visiting student

New York, NY

Jul. 2015 – Aug. 2016

Academic Appointments

North Carolina State University

Department of Computer Science, Assistant Teaching Professor

Raleigh, NC

Aug. 2023 – present

Teaching Experience

Instructor of Record

North Carolina State University

CSC 236, Computer Organization and Assembly Language for Computer Scientists

F'23 – F'25

Enrollment: around 50 students per semester.

CSC 116, Introduction to Computing - Java

F'23 – F'25

Enrollment: around 35 students per semester.

CSC 492, Senior Design Project

F'25

Enrollment: 35 students.

E 115, Introduction to Computing Environments

S'24 – S'25

Enrollment: ranging from 1,000 to 1,500 students per semester.

University of California, Irvine

ICS 45C, Programming in C/C++ as a Second Language

F'22

Enrollment: 139 students.

CS 145, Embedded Software

S'22

Enrollment: 145 students.

Teaching Assistant

University of California, Irvine

ICS 139W, Critical Writing

S'23

ICS 31, Intro to Programming

F'18 – W'22, W'23

University of Brasília

CIC 113913, Introduction to Computer Science

S'18

Undergraduate Tutor.....

University of Brasília

CIC 113913, Introduction to Computer Science

F'12 – S'14, S'16

CIC 116785, Objected Oriented Programming

S'14

Guest Lecturer.....

North Carolina State University

CSC 591/791, Embedded/Real-Time Systems for Autonomous Driving with Machine Learning

F'23

Fordham University

CISC 6080, Capstone Project in Data Science

F'18

Certificates, Training, and Awards.....

North Carolina State University

- Wolfpack Engineering Unleashed Gold Badge (2025)
- Wolfpack Engineering Unleashed Silver Badge (2024)
- Wolfpack Engineering Unleashed Incubator (2024)

University of California, Irvine

- Certificate in Excellence in Engineering Communications (2022)
- Thank a Teacher Recipient (2020)
- Certificate in Teaching Excellence (2019)
- Certificate in Course Design (2019)
- Center for Integration of Research, Teaching and Learning (CIRTL) Associate Level (2019)
- Teaching Assistant Professional Development Program (2018)

Mentoring Experience

- NC State CSC Independent Study / Research Mentor (Fall '24 – Spring '25)
Supervised 10 students across various projects in Mentored Research (CSC299), Independent Study (CSC498), and Independent Research (CSC499). Each student worked with me for 1 semester on a unique project and produced a final written report.
- NC State CSC Senior Design Project Sponsor (Spring '24)
Mentored a team of 5 undergraduate students working on a senior capstone project to develop tools for CSC 236.
- UCI Undergraduate Research Opportunities Program Research Discovery Program (Winter '22 – Spring '22)
One of 25 campus-wide mentors, worked closely with 4 CS undergrads to help them get started in research.
- Kookmin University and UCI Global Research Experience in Artificial Intelligence Program (Winter '22)
Mentored 3 undergraduate exchange students from South Korea that participated in active research projects.
- UCI Certificate in Mentoring Excellence (2021)
Certificate program which helps graduate students seeking to enhance their mentoring skills.

Research Experience

North Carolina State University

Department of Computer Science, Assistant Teaching Professor

*Advising multiple undergrads in research projects on systems and teaching tools development.
See more at batistacomputinglab.com.*

Raleigh, NC

Aug. 2023 – present

University of California, Irvine

Center for Embedded and Cyber-physical Systems, Graduate Research Assistant

Irvine, CA

Sep. 2018 – Jun. 2023

University of Brasília

Software Engineering Lab., Graduate Research Assistant

Software Engineering Lab., Undergraduate Research Assistant

Brasília, Brazil

Aug. 2017 – Aug. 2018

Aug. 2016 – Jul. 2017

Publications

Note: **boldface** indicates a member of my lab.

Forthcoming.....

- [F1] **Sumaita S. Rahman** and **Caio Batista de Melo**. *Identifying Novel CAN Bus Attack Types at Runtime*. Neverending Machine Learning, IEEE International Conference on Data Mining Workshops (ICDMW). Nov. 2025.

Journal Articles.....

- [J4] **Caio Batista de Melo**, Marzieh Ashrafiamiri, Minjun Seo, Fadi Kurdahi, and Nikil Dutt. "SAFER: Safety Assurances for Emergent Behavior". In: *IEEE Design & Test* 41.4 (2024), pp. 17–25. DOI: 10.1109/MDAT.2023.3324887.
- [J3] **Caio Batista de Melo** and Nikil Dutt. "LOCoCAT: Low-Overhead Classification of CAN Bus Attack Types". In: *IEEE Embedded Systems Letters* 15.4 (2023), pp. 178–181. DOI: 10.1109/LES.2023.3299217.
- [J2] Eberle A. Rambo, Bryan Donyanavard, Minjun Seo, Florian Maurer, Thawra Kadeed, **Caio B. de Melo**, Biswadip Maity, Anmol Surhonne, Andreas Herkersdorf, Fadi Kurdahi, Nikil Dutt, and Rolf Ernst. "The Self-Aware Information Processing Factory Paradigm for Mixed-Critical Multiprocessing". In: *IEEE Transactions on Emerging Topics in Computing* 10.1 (2022), pp. 250–266. DOI: 10.1109/TETC.2020.3011663.
- [J1] **Caio Batista de Melo**, André Luiz Fernandes Cançado, and Genáina Nunes Rodrigues. "Characterization of implied scenarios as families of common behavior". In: *Journal of Systems and Software* 158 (2019), p. 110425. ISSN: 0164-1212. DOI: <https://doi.org/10.1016/j.jss.2019.110425>.

Peer-reviewed Conferences.....

- [C3] Nora Sperling, Alex Bendrick, Dominik Stöhrmann, Rolf Ernst, Bryan Donyanavard, Florian Maurer, Oliver Lenke, Anmol Surhonne, Andreas Herkersdorf, Walaa Amer, **Caio Batista de Melo**, Ping-Xiang Chen, Quang Anh Hoang, Rachid Karami, Biswadip Maity, Paul Nikolian, Mariam Rakka, Dongjoo Seo, Saehanseul Yi, Minjun Seo, Nikil Dutt, and Fadi Kurdahi. "Information Processing Factory 2.0 - Self-awareness for Autonomous Collaborative Systems". In: *2023 Design, Automation & Test in Europe Conference & Exhibition (DATE)*. 2023, pp. 1–6. DOI: 10.23919/DATE56975.2023.10137006.
- [C2] Eberle A. Rambo, Thawra Kadeed, Rolf Ernst, Minjun Seo, Fadi Kurdahi, Bryan Donyanavard, **Caio Batista de Melo**, Biswadip Maity, Ksra Moazzemi, Kenneth Stewart, Saehanseul Yi, Amir M. Rahmani, Nikil Dutt, Florian Maurer, Nguyen Anh Vu Doan, Anmol Surhonne, Thomas Wild, and Andreas Herkersdorf. "The information processing factory: a paradigm for life cycle management of dependable systems". In: *Proceedings of the International Conference on Hardware/Software Codesign and System Synthesis Companion. CODES/ISSS '19*. New York, New York: Association for Computing Machinery, 2019. ISBN: 9781450369237. DOI: 10.1145/3349567.3357391.
- [C1] Anna Poulakas, Alon Yoeli, Sebastian Deossa, **Caio Batista de Melo**, D. Frank Hsu, Dawn J. Adams, Cesarina Javier, and Anita V. Batisti. "WATSHERE: A Watson Cognitive System to Navigate Social/Health Resources for Public Schools". In: *Global Business and Technology Association Conference (GBATA)*. Vienna, Austria, July 2017, pp. 813–823. ISBN: 1-932917-13-6.

Book Chapters

[BC1] Bryan Donyanavard, Tiago Mück, Kasra Moazzemi, Biswadip Maity, **Caio Batista de Melo**, Kenneth Stewart, Saehanseul Yi, Amir M. Rahmani, and Nikil Dutt. "Reflecting on Self-Aware Systems-on-Chip". In: *A Journey of Embedded and Cyber-Physical Systems: Essays Dedicated to Peter Marwedel on the Occasion of His 70th Birthday*. Ed. by Jian-Jia Chen. Cham: Springer International Publishing, 2021, pp. 79–95. ISBN: 978-3-030-47487-4. DOI: 10.1007/978-3-030-47487-4_6.

Technical Reports

[TR1] Eberle A. Rambo, Bryan Donyanavard, Minjun Seo, Florian Maurer, Thawra Kadeed, **Caio B. de Melo**, Biswadip Maity, Anmol Surhonne, Andreas Herkersdorf, Fadi Kurdahi, Nikil Dutt, and Rolf Ernst. *The Information Processing Factory: Organization, Terminology, and Definitions*. 2019. arXiv: 1907.01578.

Presentations

- Caio Batista de Melo and Nikil Dutt, *LOCoCAT: Low-Overhead Classification of CAN Bus Attack Types*, 19th International Conference on Compilers, Architectures, and Synthesis for Embedded Systems (Late-Breaking Track), 2023
- Caio Batista de Melo, André Luiz Fernandes Cançado, and Genaína Nunes Rodrigues, *Characterization of Implied Scenarios as Families of Common Behavior*, 35th IEEE/ACM International Conference on Automated Software Engineering (Journal-First Track), 2020
- Kenneth Stewart, Caio Batista de Melo, Saehanseul Yi, and Nikil Dutt, *Self-Aware Systems-On-Chip*, 1st UCI/UCR/UPHF International Workshop on Cyber-Physical Systems and their Applications in Intelligent and Connected Transportation System (Poster), 2019
- Kenneth Stewart, Caio Batista de Melo, Saehanseul Yi, and Nikil Dutt, *Self-Aware Systems-On-Chip*, Richard Newton Young Fellow Forum at the 56th Design Automation Conference (Poster), 2019
- Kenneth Stewart, Caio Batista de Melo, Saehanseul Yi, and Nikil Dutt, *The Information Processing Factory*, Richard Newton Young Fellow Forum at the 56th Design Automation Conference (Poster), 2019
- Caio Batista de Melo and Genaína Rodrigues, *Implied Scenario Detection Oriented Dependability Analysis*, joint 23rd University of Brasília/14th Federal District Undergraduate Research Workshop (Poster), 2017

Academic Service

University Service

- Faculty Sponsor for the Latino Association of Computer Scientists (LA/CSC), NC State, 2023-present.
- Course Coordinator for CSC 236, NC State, 2024-present.
- PhD Program Redesign Taskforce Member, NC State, 2024-present.
- Judge at Hack_NCState Hackathon, NC State, 2025.
- Judge at Hack_NCState x Code Black Hackathon, NC State, 2024.

Peer Reviewer

- The Journal of Supercomputing, Springer 2025;
- International Conference on Omni-layer Intelligent Systems (COINS) 2023;
- International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS) 2019, 2021, 2022;
- Design, Automation and Test in Europe Conference (DATE) 2021, 2022;
- Asia and South Pacific Design Automation Conference (ASP-DAC) 2022;
- International Conference on VLSI Design (VLSID) 2021.

Committee Member

- Saleh Almahmoud, *Amplitude Modulated Characterization and Calibration of Phased Arrays Using Non-Coherent Detection*, PhD Final Defense, Department of Electrical and Computer Engineering, NC State, Graduate School Representative, 2025.

- Andre Nogueira, *Photoinduced Electron Spin Polarization of Stable Radicals using Ligand-to-Ligand Charge Transfer Chromophores*, PhD Preliminary Exam, Department of Chemistry, NC State, Graduate School Representative, 2024.
- Saleh Almahmoud, *Orthogonal Amplitude Code Modulated Characterization and Calibration of Phased Arrays Using Non-coherent Detection*, PhD Preliminary Exam, Department of Electrical and Computer Engineering, NC State, Graduate School Representative, 2024.
- Matt Morano, *Development of Electronics and Simulations for the nEDM@SNS Experiment*, PhD Final Defense, Department of Physics, NC State, Graduate School Representative, 2023.

Other Certificates, Honors, and Awards

- UCI Graduate Division Preparing for a Faculty Career Certificate (2022)
- Design and Automation Conference (DAC) A. Richard Newton Young Student Fellow (2019)
- UCI Dean's Award (2018–2019)
- Brazilian Coordination for the Improvement of Higher Education Personnel (CAPES) Scholarship (2017–2018)
- Brazilian National Council for Scientific and Technological Development (CNPq) Scholarship (2016–2017)
- Fordham University's Student Ambassador at the International Conference on Cyber Security (2016)
- Institute of International Education (IIE) Brazil Scientific Mobility Program (2015–2016)

Skills

Programming Languages.....

- Python, C, C++, SQL, Java.

Spoken Languages.....

- Native fluency: English, Portuguese;
- Basic communication: Spanish.

Industry Experience

Meta

Network Planning, PhD Software Engineer Intern

Menlo Park, CA

Jun. 2022 – Sep. 2022

Google

CloudNet Control, Software Engineering Intern

Cloud CDN, Software Engineering Intern

Irvine, CA

Jun. 2021 – Sep. 2021

Jun. 2020 – Sep. 2020

Cal/Amp

Information Security, IT/Product Security Intern

Irvine, CA

Jun. 2019 – Sep. 2019

University of Brasília

Computer Science Department, Java Development Intern

Brasília, Brazil

Feb. 2015 – Jul. 2015