

# ANTONIO ANASTASIO BRUTO DA COSTA

## CURRICULUM VITAE

### PERSONAL DETAILS

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| <b>Date, Place of Birth</b> | : 14-12-1988, Margão, Goa, India  |
| <b>Address (Goa,India)</b>  | : House No. 39B, Behind St. Paul Chapel, Pedda Grande, Benaulim, Goa - 403716   |
| <b>E-mail</b>               | : <a href="mailto:antonio.cse.iitkgp@gmail.com">antonio.cse.iitkgp@gmail.com</a> / <a href="mailto:antonio@iitkgp.ac.in">antonio@iitkgp.ac.in</a> |
| <b>Language Proficiency</b> | : English, Portuguese, Konkani, and Hindi.  |
| <b>Hobbies</b>              | : Piano, Teaching, Ballroom dancing, Singing, Badminton<br>Refer to my <a href="#">Youtube Channel (antoniobdacosta)</a> for my Piano Covers.     |
| <b>Research Interests</b>   | : Formal Languages and Verification, Temporal Causal Reasoning and Artificial Intelligence  |
| <b>Website</b>              | : <a href="http://cse.iitkgp.ac.in/~bdcaa/">cse.iitkgp.ac.in/~bdcaa/</a>  |
| <b>Student Memberships</b>  | : IEEE (since 2015), Semiconductor Research Consortium (since 2013)   |

### EDUCATIONAL QUALIFICATIONS

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| Year of Completion | Course   | Completion / CGPA / Percentage         |
|--------------------|--|--|
| 2020               | <b>PhD, Computer Science and Engineering</b><br>Indian Institute of Technology – Kharagpur   | Defended<br>13 <sup>th</sup> July 2020 |
| 2014               | <b>M.Tech., Computer Science and Engineering (Department 1<sup>st</sup> Rank)</b><br>Indian Institute of Technology – Kharagpur                          | 9.92(CGPA)                             |
| 2012               | <b>Graduate Aptitude Test in Engineering (GATE)</b>  | 99.83 Percentile                       |
| 2010               | <b>Bachelor of Computer Engineering</b><br><b>State Gold Medalist, 1<sup>st</sup> Rank in Goa University</b><br>Goa University - Goa Engineering College | 78.68%                                 |
| 2006               | <b>Distinction in the Higher Secondary School Certificate Examination</b><br>Goa Board - Shree Damodar Higher Secondary School of Science                | 86.67%                                 |
| 2004               | <b>Distinction in the Secondary School Certificate Examination</b><br>Goa Board - Loyola High School   | 87.73%                                 |

### RESEARCH AND CORPORATE WORK EXPERIENCE

**Persistent Systems ([www.persistentsys.com](http://www.persistentsys.com)) (Position: Software Engineer)** July 2010 – June 2012  
Responsibilities included: development and maintenance of web applications for clients and liaising with team members to identify issues, to contribute ideas and solutions for developing and maintaining web application. During this time I worked on technologies including (but not limited to) Java, Groovy on Grails, Hibernate, Spring, and relational database systems.

**Texas Instruments, Bangalore (Position: Intern)** January 2014  
The work was aimed at finding and fixing gaps in current research at IIT-Kharagpur. The research applies formal methods to extract feature signature value ranges from Hybrid Automata models of Analog-Mixed Signal Circuits.

**Verimag Laboratory, Grenoble, France (Position: Intern)** May-July 2014  
The work focused on developing methods for set based reachability analysis of linear hybrid automata using support function representations for sets.

**Department of Computer Science, Indian Institute of Technology Kharagpur** July 2012-2020  
**(Positions: Teaching Assistant, Research Fellow [Masters & PhD])**  
Research work on quantitative languages for the formal analysis of hybrid systems modeled as hybrid automata, and automated learning of temporal causal relations from time-series data over dense time. Also refer to the Section "Teaching Experience".

### TEACHING EXPERIENCE (since 2013)

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*With both parents being teachers, I have always had a passion for teaching. In addition to my informal attempts at teaching, the more formal experiences are listed here:*

**Teaching Assistantships at IIT Kharagpur in:** Foundations of Computer Science, Artificial Intelligence, Formal Systems, Advanced Graph Theory, Distributed Systems, Testing and Verification of Systems, Programming and Data Structures.

**Lectures Delivered:** On the use of SAT Solvers (Foundations of AI and ML, 2019), Timed and Hybrid Systems (Formal Systems, Spring 2018-19, Spring 2019-20)

**Online Lectures Prepared:** On Regular Languages and Finite Automata ([Youtube: antoniobdacosta](#))

## PUBLICATIONS

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### ARXIV

- [Antonio Anastasio Bruto da Costa, Pallab Dasgupta, Flexible Learning of Temporal Causal Sequence Relationships from Time-Series. CoRR abs/1905.12262 \(2019\)](#)

### Journals

1. Antonio A. Bruto da Costa, Goran Frehse, Pallab Dasgupta. [Formal Feature Interpretation of Hybrid Systems](#), IEEE Transactions on CAD, 2018, DOI: 10.1109/TCAD.2018.2857361.
2. Antara Ain, Antonio A. Bruto da Costa, Pallab Dasgupta. [Feature Indented Assertions for Analog and Mixed-Signal Validation](#), IEEE Transactions on CAD, ISSN: 0278-0070, DOI: 10.1109/TCAD.2016.2525798.
3. Antonio A. Bruto da Costa, Pallab Dasgupta. [Formal Interpretation of Assertion-Based Features on AMS Designs](#), IEEE Design & Test, vol. 32, no. 1, 2014, pp: 9-17.

### Conferences / Symposia / Workshops

1. Antonio A. Bruto da Costa, Goran Frehse, Pallab Dasgupta. [Flexible Mining of Causal Relations from Hybrid System Traces](#). [POSTER] [ARTICLE] Work-In-Progress Session at Design Automation Conference (DAC) 2019, Las Vegas, U.S.A.
2. Mandal S., Chaudhuri S., Bruto da Costa A., Karambelkar G., Dasgupta P. [On the Deep Structure of Ragas and Analytic Rating of Music Scores](#), In: Chanda B., Chaudhuri S., Chaudhuri S. (eds) Heritage Preservation (2018). Springer, Singapore
3. Antonio A. Bruto da Costa, Sudipa Mandal, Shriya Dharade, Pallab Dasgupta. [AMS-Miner: Mining AMS Assertions using Interval Arithmetic](#), In the 31st Proceedings of International Conference on VLSI Design (VLSID), January 2018.
4. Antonio Bruto Da Costa, Pallab Dasgupta. [ForFET: A Formal Feature Evaluation Tool for Hybrid Systems \(Tool Paper\)](#), In the 15th International Symposium on Automated Technology for Verification and Analysis, ATVA 2017, October 2017.
5. Sudipa Mandal, Antonio A. Bruto da Costa, Aritra Hazra, Pallab Dasgupta, Bhushan Naware, Chunduri Rama Mohan and Sanjib Basu. [Formal Verification of Power Management Logic with Mixed-Signal Domains](#), In the 30th Proceedings of International Conference on VLSI Design (VLSID), pp. 239-244, January 2017. Awarded as the BEST STUDENT PAPER.
6. Antonio Bruto Da Costa, Pallab Dasgupta. [Generating AMS Behavioral Models with Formal Guarantees on Feature Accuracy](#), VLSI Design 2017, 13th International Conference on VLSI Design & 16th International Conference on Embedded Systems, January 2017.
7. Antonio Bruto Da Costa, Pallab Dasgupta, and Goran Frehse. [Formal Feature Analysis of Hybrid Automata](#), MEMOCODE'16, 14th ACM-IEEE International Conference on Formal Methods and Models for System Design, November 2016.

## AWARDS

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1. **Best Student Paper Award at the VLSI Design Conference, 2017.**
2. **Department Rank 1, Silver medalist, Master of Technology in Computer Science and Engineering, Indian Institute of Technology Kharagpur, May 2014.**
3. **University Rank 1, Bachelors of Computer Engineering, Goa University – Goa Engineering College, May 2010.**
4. Certificate of Merit: By **Fundação Oriente** for ranking **Second in Portuguese in the H.S.S.C Examination, 2005-2006.**
5. Certificate of Merit: By **Fundação Oriente** for ranking **Third in Portuguese in the S.S.C Examination, 2003-2004.**

## REFERENCES

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1. **Prof. Pallab Dasgupta**, FNAE, FASc, FIETE, A K Singh Distinguished Chair Professor in Artificial Intelligence, Department of Computer Science & Engineering, Indian Institute of Technology Kharagpur, Kharagpur, INDIA 721302. Phone: +91 3222 283470. Email : pallab@cse.iitkgp.ac.in
2. **Prof. Goran Frehse**, Associate Professor, Hybrid Systems Semantics group, Computer Science and System Engineering Laboratory (U2IS), ENSTA ParisTech, 828, Boulevard des Maréchaux, 91762 Palaiseau Cedex, France. Phone: +33 18 187 2076. Email: goranf@gmail.com
3. **Prof. P. P. Chakraborty**, FNA, FASc, FNAE, Professor, Dept. of Computer Science and Engineering, Jointly with Centre of Excellence in Artificial Intelligence, Indian Institute of Technology Kharagpur, Kharagpur, INDIA 721302. Phone: +91 3222 283466. Email : ppchak@cse.iitkgp.ac.in
4. **Prof. Thao Dang**, Research Director (Directeur de Recherche DR2) of the CNRS (French National Center for Scientific Research), Office 205, Verimag, Batiment IMAG, Université Grenoble Alpes, 700 avenue centrale, 38400 Saint Martin d'Herès, France, Phone: +33 4 57 42 22 12; Fax: +33 4 57 42 22 22. Email: thao.dang@imag.fr
5. **Prof. Erika Abraham**, Professor, LuFG Theory of Hybrid Systems, Erweiterungsbau 1, 2nd Floor, Room 4229, Ahornstrasse 55, 52074 Aachen, Germany. Phone: +49 241 80 24242, Fax: +49 241 80 22243. Email: abraham@cs.rwth-aachen.de