

# Curriculum Vitae

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Sidi Mohamed Beillahi

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IRIF

Université de Paris

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## ❖ Summary

I am interested in algorithmic verification, formal methods, and applying programming language techniques to improve asynchronous, concurrent, distributed, and quantum systems and smart contracts.

## ❖ Education

### Doctorate — Computer Science

*Dec 2017 – Mar 2021*

Thesis Title: [Automated Reasoning about Weak Consistency in Distributed Software](#)

Université de Paris, France

Advisors: Ahmed Bouajjani and Constantin Enea

### Master of Applied Science — Computer Engineering

*Sep 2014 – Nov 2016*

Thesis Title: [Towards the Design Automation of Quantum Circuits](#)

Concordia University, Canada

Advisor: Sofiène Tahar

### Engineer's Degree — Polytechnicien

*Sep 2011 – Jun 2014*

Thesis Title: [Formalization of Signal-Flow Graphs in HOL](#)

Tunisia Polytechnic School, Tunisia

Advisor: Sofiène Tahar

### DEUPC — Mathematics and Physics

*Sep 2009 – Jun 2011*

Sfax Preparatory Engineering Institute

University of Sfax, Tunisia

## ❖ Experience

### Research Assistant, Université de Paris

*Dec 2017 – Mar 2021*

Advisors: Ahmed Bouajjani and Constantin Enea

Paris, France

### Teaching Assistant, Université de Paris

*Sep 2018 – Jan 2021*

### Research Intern, SRI International

*Apr 2019 – Aug 2019*

Advisor: Michael Emmi

New York City, USA

### Software Programmer, TRU Simulation + Training

*May 2017 – Dec 2017*

Montréal, Canada

### Research Assistant, Concordia University

*Mar 2014 – Nov 2016*

Advisor: Sofiène Tahar

Montréal, Canada

### Teaching Assistant, Concordia University

*Sep 2015 – May 2016*

### Research Engineer, Marinvent inc.

*Mar 2016 – Nov 2016*

Advisor: Sofiène Tahar

Montréal, Canada

### Intern, STMicroelectronics

*Jul 2013 – Aug 2013*

Advisor: Mohamed Ben Ahmed

Tunis, Tunisia

### Intern, Mauritel S.A

*Aug 2012 – Aug 2012*

Advisor: Mohamed Moujtaba

Nouakchott, Mauritania

## ❖ Awards and Recognitions

- Best Undergraduate Thesis, Tunisia Polytechnic School, 2014.

- Ranked 31st in the National Grandes Ecoles Exam, Tunisia, 2011.
- Olympian in the International Mathematical Olympiad, Germany, 2009.
- Ranked 3rd in the National Mathematical Olympiad, Mauritania, 2009.
- Ranked 1st in the National Bac Exam in Mathematics, Mauritania, 2009.

## ❖ Grants and Scholarships

- VMW Scholarship Award for CAV 2016, USD 650.
- Concordia Graduate Student Association Conference Funding for CAV 2016, CAD 100.
- Concordia University Conference and Exposition Award for NFM 2016, CAD 1,000.
- Graduate Student Support Program, Concordia University, 2014 – 2016, CAD 20,000.
- National Scholarship, Mauritania, 2009 – 2014, EUR 13,500.
- Scholarship Award to Participate in the International Mathematical Olympiad, Mauritania, 2009, EUR 1,000.

## ❖ Service

- Co-organizer, IRIF Verification Seminar, Mar 2020 – July 2020.
- Artificat Evaluation Committees: POPL 2021, CAV 2021.
- Sub-Reviewer: CAV 2020, VMCAI 2020, FTSCS 2016.
- Student Volunteer: CAV 2016.

## ❖ Journal Publications

- |    |  |          |
|----|--|----------|
| J2 | <b>Robustness Against Transactional Causal Consistency</b><br>Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea<br><i>Logical Methods in Computer Science</i> , 17(1): 12:1 – 12:42<br><b>Invited Special Issue from CONCUR 2019</b> | Feb 2021 |
| J1 | <b>A Modeling and Verification Framework for Optical Quantum Circuit</b><br>Sidi Mohamed Beillahi, Mohamed Yousri Mahmoud, Sofiène Tahar<br><i>Formal Aspects of Computing</i> , 31(3): 321 – 351  | Mar 2019 |

## ❖ Conference Publications

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|----|---|----------|
| C8 | <b>Smart Contracts Refinement for Gas Optimization</b><br>Keerthi Nelaturu, Sidi Mohamed Beillahi, Fan Long, Andreas Veneris<br><i>under submission, 2021</i>   | Apr 2021 |
| C7 | <b>Automated Synthesis of Asynchronizations</b><br>Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea, Shuvendu Lahiri<br><i>under submission, 2021</i>  | Jan 2021 |
| C6 | <b>Checking Robustness Between Weak Transactional Consistency Models</b><br>Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea<br><i>In Proc. 30th European Symposium on Programming (ESOP), 2021</i>  | Dec 2020 |
| C5 | <b>Behavioral Simulation for Smart Contracts</b><br>Sidi Mohamed Beillahi, Gabriela Ciocarlie, Michael Emmi, Constantin Enea<br><i>In Proc. 41st annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI), 2020</i> | Jun 2020 |
| C4 | <b>Robustness Against Transactional Causal Consistency</b><br>Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea<br><i>In Proc. 30th International Conference on Concurrency Theory (CONCUR), 2019</i><br><b>Invited to a Special Issue</b>  | Sep 2019 |

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| C3 | <b>Checking Robustness Against Snapshot Isolation</b><br>Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea<br><i>In Proc. 31st International Conference on Computer Aided Verification (CAV), 2019</i> | Jul 2019 |
| C2 | <b>Hierarchical Verification of Quantum Circuits</b><br>Sidi Mohamed Beillahi, Mohamed Yousri Mahmoud, Sofiène Tahar<br><i>In Proc. 8th International Symposium NASA Formal Methods (NFM), 2016</i>          | Jun 2016 |
| C1 | <b>Formal Analysis of Power Electronic Systems</b><br>Sidi Mohamed Beillahi, Umair Siddique, Sofiène Tahar<br><i>In Proc. 17th International Conference on Formal Engineering Methods (ICFEM), 2015</i>      | Nov 2015 |

## ❖ Workshop Publications

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|----|---|----------|
| W3 | <b>Formal Analysis of Engineering Systems Based on Signal-Flow-Graph Theory</b><br>Sidi Mohamed Beillahi, Umair Siddique, Sofiène Tahar<br><i>In Proc. 9th International Workshop Numerical Software Verification (NSV-CAV), 2016</i>   | Jul 2016 |
| W2 | <b>On the Formal Analysis of Photonic Signal Processing Systems</b><br>Umair Siddique, Sidi Mohamed Beillahi, Sofiène Tahar<br><i>In Proc. 20th International Workshop Formal Methods for Industrial Critical Systems (FMICS), 2015</i> | Jun 2015 |
| W1 | <b>A Tool for the Formal Verification of Quantum Optical Computing Systems</b><br>Sidi Mohamed Beillahi, Mohamed Yousri Mahmoud, Sofiène Tahar<br><i>In Proc. Automated Reasoning Workshop (ARW), 2015</i>                              | Apr 2015 |

## ❖ Teaching

- Teaching Assistantships at Université de Paris
  - Automata and Lexical Analysis for 2nd Year Computer Science Students, Sep 2020 – Dec 2020.
  - Principles of Binary Machines for 1st Year Computer Science Students, Sep 2020 – Dec 2020.
  - Java Programming for 1st Year Computer Science Students, Sep 2019 – Dec 2019.
  - Principles of Object-Oriented Programming in Java for 2nd Year Computer Science Students, Sep 2019 – Dec 2019.
  - Python Programming for 1st Year Social Science Students, Sep 2018 – Dec 2018.
  - Relational Databases and SQL for 2nd Year Computer Science Students, Sep 2018 – Dec 2018.
- Teaching Assistantships at Concordia University
  - Hardware Functional Verification for Senior Undergraduate and Graduate Students, Jan 2016 – Apr 2016.
  - Computer Architecture and Design for Graduate Students, Jan 2016 – Apr 2016.
  - Digital Design for Undergraduate Students, Jan 2016 – Apr 2016.
  - Microprocessors and their Applications for Graduate Students, Sep 2015 – Dec 2015.

## ❖ Talks

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| <b>Checking Robustness Between Weak Transactional Consistency Models</b><br>ESOP 2021, Luxembourg, Luxembourg (virtual)                             | Mar 2021             |
| <b>Behavioral Simulation for Smart Contracts</b><br>SEMINAR UM6P-CS, Morocco (virtual)<br>PLDI 2020, London, UK (virtual)                           | Jul 2020<br>Jun 2020 |
| <b>Robustness Against Transactional Causal Consistency</b><br>IRIF Verification Seminar, Université de Paris<br>CONCUR 2019, Amsterdam, Netherlands | Dec 2019<br>Sep 2019 |

**Checking Robustness Against Snapshot Isolation**

ANR Project AdeCoDS Kick-off Meeting, Paris, France

*Nov 2019*

CAV 2019, New York City, USA

*Jul 2019***Formal Analysis of Engineering Systems Based on Signal-Flow-Graph Theory***Jul 2016*

NSV-CAV 2016

Toronto, Canada

**Hierarchical Verification of Quantum Circuits***Jun 2016*

NFM 2016

Minneapolis, USA

**Formal Analysis of Power Electronic Systems***Oct 2015*

Hardware Verification Group Meeting

Concordia University

**On the Formal Analysis of Photonic Signal Processing Systems***May 2015*

Hardware Verification Group Meeting

Concordia University