

Curriculum Vitae

December 20, 2021

Sidi Mohamed Beillahi

Postdoctoral Researcher
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❖ Summary

I am interested in algorithmic verification, formal verification, and programming languages. I develop new techniques to improve the reliability of software systems. I work in a variety of application areas: distributed systems, blockchain, smart contracts, and asynchronous programming.

❖ Education

Doctorate — Computer Science

Thesis Title: [Automated Verification of Programs Running on top of Distributed Systems](#)
Advisors: Ahmed Bouajjani and Constantin Enea
Dec 2017 – Mar 2021
Université de Paris, France

Master of Applied Science — Computer Engineering

Thesis Title: [Towards the Design Automation of Quantum Circuits](#)
Advisor: Sofiène Tahar
Sep 2014 – Nov 2016
Concordia University, Canada

Engineer's Degree — Polytechnicien

Thesis Title: [Formalization of Signal-Flow Graphs in HOL](#)
Advisor: Sofiène Tahar
Sep 2011 – Jun 2014
Tunisia Polytechnic School, Tunisia

DEUPC — Mathematics and Physics

Sep 2009 – Jun 2011
Sfax Preparatory Engineering Institute
University of Sfax, Tunisia

❖ Experience

Postdoctoral Researcher, University of Toronto

Advisors: Fan Long and Andreas Veneris
Jun 2021 – present
Toronto, Canada

Research Assistant, Université de Paris

Advisors: Ahmed Bouajjani and Constantin Enea
Dec 2017 – May 2021
Paris, France

Teaching Assistant, Université de Paris

Sep 2018 – Jan 2021

Research Intern, SRI International

Advisor: Michael Emmi
Apr 2019 – Aug 2019
New York City, USA

Software Programmer, TRU Simulation + Training

May 2017 – Dec 2017
Montréal, Canada

Research Assistant, Concordia University

Advisor: Sofiène Tahar
Mar 2014 – Nov 2016
Montréal, Canada

Teaching Assistant, Concordia University

Sep 2015 – May 2016

Research Engineer, Marinvent inc.

Advisor: Sofiène Tahar
Mar 2016 – Nov 2016
Montréal, Canada

Intern, STMicroelectronics

Advisor: Mohamed Ben Ahmed
Jul 2013 – Aug 2013
Tunis, Tunisia

Intern, Mauritel S.A

Advisor: Mohamed Moujtaba
Aug 2012 – Aug 2012
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, OOPSLA 2021, POPL 2022, OOPSLA 2022.
- Extended Review Committees: OOPSLA 2022.
- Sub-Reviewer: FTSCS 2016, VMCAI 2020, CAV 2020.
- Student Volunteer: CAV 2016.

❖ Journal Publications

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

❖ Conference Publications

- C11 **Automated Auditing of Ponzi Scheme Smart Contract TOD Vulnerabilities** 2021
Sidi Mohamed Beillahi, Eric Keilty, Keerthi Nelaturu, Andreas Veneris, Fan Long
under submission, 2021
- C10 **LMPTs: Eliminating Storage Bottlenecks for Processing Blockchain Transactions** 2021
Jemin Andrew Choi, Sidi Mohamed Beillahi, Peilun Li, Andreas Veneris, Fan Long
under submission, 2021
- C9 **SigVM: Toward Fully Autonomous Smart Contracts** 2021
Zihan Zhao, Sidi Mohamed Beillahi, Ryan Song, Yuxi Cai, Andreas Veneris, Fan Long
under submission, 2021
- C8 **Automated Synthesis of Asynchronizations** 2021
Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea, Shuvendu Lahiri
under submission, 2021

C7	Smart Contracts Refinement for Gas Optimization Keerthi Nelaturu, Sidi Mohamed Beillahi, Fan Long, Andreas Veneris <i>In Proc. 3rd Conference on Blockchain Research & Applications for Innovative Networks and Services (BRAINS), 2021</i>	Sep 2021
C6	Checking Robustness Between Weak Transactional Consistency Models Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea <i>In Proc. 30th European Symposium on Programming (ESOP), 2021</i>	Mar 2021
C5	Behavioral Simulation for Smart Contracts Sidi Mohamed Beillahi, Gabriela Ciocarlie, Michael Emmi, Constantin Enea <i>In Proc. 41st annual ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI), 2020</i>	Jun 2020
C4	Robustness Against Transactional Causal Consistency Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea <i>In Proc. 30th International Conference on Concurrency Theory (CONCUR), 2019</i>	Sep 2019
C3	Checking Robustness Against Snapshot Isolation Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea <i>In Proc. 31st International Conference on Computer Aided Verification (CAV), 2019</i>	Jul 2019
C2	Hierarchical Verification of Quantum Circuits Sidi Mohamed Beillahi, Mohamed Yousri Mahmoud, Sofiène Tahar <i>In Proc. 8th International Symposium NASA Formal Methods (NFM), 2016</i>	Jun 2016
C1	Formal Analysis of Power Electronic Systems Sidi Mohamed Beillahi, Umair Siddique, Sofiène Tahar <i>In Proc. 17th International Conference on Formal Engineering Methods (ICFEM), 2015</i>	Nov 2015

❖ Workshop Publications

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

❖ Mentoring

- Keerthi Nelaturu, PhD student, University of Toronto
- Zihan Zhao, MSc student, University of Toronto
- Zhiyang Chen, MSc student, University of Toronto
- Eric Keilty, MSc student, University of Toronto

❖ Talks

Checking Robustness Between Weak Transactional Consistency Models

ANR Project AdeCoDS Meeting, LIP6, Sorbonne University (virtual)	<i>Jun 2021</i>
IRIF Verification Seminar, Université de Paris (virtual)	<i>May 2021</i>
ESOP 2021, Luxembourg, Luxembourg (virtual)	<i>Mar 2021</i>

Behavioral Simulation for Smart Contracts

GROUP SEMINAR, University of Toronto (virtual)	<i>Dec 2021</i>
SEMINAR UM6P-CS, Morocco (virtual)	<i>Jul 2020</i>
PLDI 2020, London, UK (virtual)	<i>Jun 2020</i>

Robustness Against Transactional Causal Consistency

IRIF Verification Seminar, Université de Paris	<i>Dec 2019</i>
CONCUR 2019, Amsterdam, Netherlands	<i>Sep 2019</i>

Checking Robustness Against Snapshot Isolation

ANR Project AdeCoDS Kick-off Meeting, IRIF, Université de Paris	<i>Nov 2019</i>
CAV 2019, New York City, USA	<i>Jul 2019</i>

Formal Analysis of Engineering Systems Based on Signal-Flow-Graph Theory

NSV-CAV 2016	<i>Jul 2016</i>
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Toronto, Canada

Hierarchical Verification of Quantum Circuits

NFM 2016	<i>Jun 2016</i>
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Minneapolis, USA

Formal Analysis of Power Electronic Systems

Hardware Verification Group Meeting	<i>Oct 2015</i>
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Concordia University

On the Formal Analysis of Photonic Signal Processing Systems

Hardware Verification Group Meeting	<i>May 2015</i>
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Concordia University