

Curriculum Vitae

May 6, 2022

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 including concurrent programs, distributed systems, blockchain, smart contracts, and asynchronous programs.

❖ 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
University of 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, University of Paris

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

Teaching Assistant, University of 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

- IEEE ICBC Distinguished Paper Award, 2022.
- Invited to a Journal Special Issue for Selected CONCUR 2019 Papers, 2019.
- 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, Blockchain 2021, ICBC 2022, ICDCS 2022.
- 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 **SigVM: Enabling Event-Driven Execution for Truly Decentralized Smart Contracts** 2022
Zihan Zhao, Sidi Mohamed Beillahi, Ryan Song, Yuxi Cai, Andreas Veneris, Fan Long
under submission, 2022
- C10 **Automated Synthesis of Asynchronizations** 2022
Sidi Mohamed Beillahi, Ahmed Bouajjani, Constantin Enea, Shuvendu Lahiri
under submission, 2022
- C9 **Automated Auditing of Price Gouging TOD Vulnerabilities in Smart Contracts** May 2022
Sidi Mohamed Beillahi, Eric Keilty, Keerthi Nelaturu, Andreas Veneris, Fan Long
In Proc. IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2022

C8	LMPTs: Eliminating Storage Bottlenecks for Processing Blockchain Transactions Jemin Andrew Choi, Sidi Mohamed Beillahi, Peilun Li, Andreas Veneris, Fan Long <i>In Proc. IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2022</i> IEEE ICBC Distinguished Paper Award.	May 2022
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> Invited to a Journal Special Issue for Selected CONCUR 2019 Papers.	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 University of 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 Graduate and Senior Undergraduate 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.

❖ Supervision

- Keerthi Nelaturu, Ph.D. student, University of Toronto
- Zihan Zhao, MASc student, University of Toronto
- Zhiyang Chen, MASc student, University of Toronto
- Eric Keilty, MASc student, University of Toronto
- Srisht Fateh Singh, MASc student, University of Toronto
- Hossein Ghotbaddini, MASc student, University of Toronto

❖ Talks

Automated Auditing of Price Gouging TOD Vulnerabilities in Smart Contracts

ICBC 2022, Shanghai, China (virtual)

May 2022

Checking Robustness Between Weak Transactional Consistency Models

ANR Project AdeCoDS Meeting, LIP6, Sorbonne University (virtual)

Jun 2021

IRIF Verification Seminar, University of Paris (virtual)

May 2021

ESOP 2021, Luxembourg, Luxembourg (virtual)

Mar 2021

Behavioral Simulation for Smart Contracts

GROUP SEMINAR, University of Toronto (virtual)

Dec 2021

SEMINAR UM6P-CS, Morocco (virtual)

Jul 2020

PLDI 2020, London, UK (virtual)

Jun 2020

Robustness Against Transactional Causal Consistency

IRIF Verification Seminar, University of Paris

Dec 2019

CONCUR 2019, Amsterdam, Netherlands

Sep 2019

Checking Robustness Against Snapshot Isolation

ANR Project AdeCoDS Kick-off Meeting, IRIF, University of Paris

Nov 2019

CAV 2019, New York City, USA

Jul 2019

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

NSV-CAV 2016

Jul 2016

Toronto, Canada

Hierarchical Verification of Quantum Circuits

NFM 2016

Jun 2016

Minneapolis, USA

Formal Analysis of Power Electronic Systems

Hardware Verification Group Meeting

Oct 2015

Concordia University

On the Formal Analysis of Photonic Signal Processing Systems

Hardware Verification Group Meeting

May 2015

Concordia University