Sasha Rubin

Curriculum Vitae, June 2017

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Personal Information

Citizenship New Zealand

Languages English (first language), Italian (beginner), French (studying)

Current Appointment

2017-present **PostDoc. (Computer Science)**, *University of Naples "Federico II"*, Fellow of the ASTREA lab.

Academic Qualifications

1999-2007 **PhD**, *Department of Mathematics and Department of Computer Science*, University of Auckland, (Completed 2004, Awarded 2007).
Best Doctoral Thesis in the Faculty of Science

1997-1998 **MSc**, *Department of Mathematics and Department of Computer Science*, University of Auckland, First Class.

1994-1996 **BSc**, *Department of Mathematics and Department of Computer Science*, University of Cape Town, Dean's Merit List.

Previous Appointments

2015-2017 **PostDoc. (Computer Science)**, *University of Naples "Federico II"*, Marie Curie Fellow of INdAM "F. Severi".

2014-2015 **PostDoc. (Computer Science)**, *TU Wien and TU Graz*.

2012-2014 **PostDoc. (Computer Science)**, *TU Wien and IST Austria*.

2010-2012 **Honorary Research Fellow (Computer Science)**, *University of Auckland*.

2010-2010 **Visiting Lecturer (Mathematics)**, *University of Cape Town*.

2009-2010 **Visiting Researcher (Computer Science)**, *University of Auckland*.

2008-2009 **Visiting Assistant Professor (Mathematics)**, *Cornell University*.

2004-2008 **Honorary Research Fellow (Computer Science)**, *University of Auckland*, New Zealand Science and Technology Postdoctoral Fellowship.

Research Interests

My main interest is in formal methods for artificial intelligence, particularly strategic and epistemic reasoning for multi-agent systems. I have contributed to the following areas:

- Formal methods (Modeling, Verification, Synthesis) of Multi-agent Systems (including Parameterised Systems, Distributed Systems, Probabilistic Systems, Timed Systems)
- Logics for Games and Strategic Reasoning
- Foundations of Planning
- Automata Theory
- Finite and Algorithmic Model Theory

Research Accomplishments

2016-2017 I teamed up with world-experts in automated planning and multi-agent systems and made theoretical contributions to verification of synthesis under imperfect information **BLMR17IJCAI**, **BLMR17**, **BMMRV17**, **BDGR17**, **GMRS16IJCAI**

2014-2015 I opened the direction of formal methods for parameterised light-weight mobile agents with **DBLP:conf/atal/Rubin15** Subsequently (with my co-authors) I continued this direction with **DBLP:conf/prima/RubinZMA15** (which won a best-paper award) and **DBLP:conf/atal/AminofMRZ16**

2012-2014 I (with my co-authors) generalised a cornerstone paper on verification of parameterised systems ("Reasoning about Rings", E.A. Emerson, K.S. Namjoshi, POPL, 1995) from ring topologies to arbitrary topologies (34 citations) **DBLP:conf/vmcai/AminofJKR14** We also completed a book, published by Morgan & Claypool, surveying decidability results in parameterised verification **DBLP:series/synthesis/2015Bloem**

2008-2011 I published a survey and extension of the main results in my thesis in the Bulletin of Symbolic Logic **DBLP:journals/bsl/Rubin08** With a PhD student of Erich Grädel's (Tobias Ganzow) I solved a 12 year-old conjecture of Courcelle's **DBLP:conf/stacs/GanzowR08**

1999-2007 During and after my PhD I (and my co-authors) pioneered the development of the theory of automatic structures. My most cited publications in this area are: **DBLP:conf/lics/KhoussainovNRS04** (96 citations; all citation counts are as reported by Google Scholar) and **DBLP:journals/bsl/Rubin08** (90 citations).

Awards

PhD Prize **Best doctoral thesis in the Faculty of Science, University of Auckland, 2004**.

PhD Prize **Montgomery memorial prize in logic from the Department of Philosophy, 2004**.

Paper Prize **Best-paper award at PRIMA 2015, DBLP:conf/prima/RubinZMA15**.

Funding and Grant writing

Individual Funding

2015-2016 **2 year Marie Curie Fellowship of INdAM "F. Severi"**, *€52100*, Ranked 4th out of 27 applicants
`https://cofund.altamatematica.it/2012/main/website?page=call-1`.

2004-2007 **3 year New Zealand Science and Technology Postdoctoral Fellowship**, *UOAX0413*, Salary, Travel, Expenses.

Grant writing

2017 Assisted Giuseppe De Giacomo with writing an ERC grant application.

2017 Assisted Aniello Murano's postdoc with writing an INdAM postdoctoral application.

2016-2017 Assisted Florian Zuleger with writing an Austrian Science Fund grant application.

2014 Assisted Helmut Veith with writing and editing Austrian Science Fund grant applications and reports for the National Research Network (NFN).
`http://arise.or.at/`

Teaching

While at Cornell, I sought out a number of teaching mentors including Maria Terrell (Department of Mathematics) and David Way (associate director of the Cornell University Centre for Teaching Excellence) to discuss successful teaching strategies, both philosophical and concrete. According to my student evaluations, I was clear, organised, proactively willing to help, and motivating.

Complete Courses

2010 **Logic and Computation**, *University of Cape Town, 40 students*, Duties: Designed the course, 30 lectures, 12 tutorials, 1 class test, 1 final exam, Department of Mathematics, University of Cape Town.

2008-2009 **Calculus for Engineers**, *Department of Mathematics, Cornell University, 25-30 students, taught the course 5 times*, Duties: Lectures, weekly online quizzes, marking.

2001 **Pre-calculus**, *Department of Mathematics, University of Wisconsin, Madison, +-30 students, taught the course 4 times*, Duties: Lectures, tutorials, marking.

Partial Courses

2007 **Discrete Structures in Mathematics and Computer Science**, *Department of Computer Science, University of Auckland*, Duties: Lectures, tutorials.

2007 **Mathematical Foundations of Software Engineering** , *Department of Computer Science, University of Auckland*, Duties: Lectures, tutorials.

2003 **Introduction to Formal Verification**, *Department of Computer Science, University of Auckland*, Duties: Lectures, tutorials.

2002 **Automata theory**, *Department of Computer Science, University of Auckland*, Duties: Lectures, tutorials.

Undergraduate Supervision

While at Cornell I mentored six students for three months. This resulted in two publications **DBLP:journals/tcs/GrinshpunPRT DBLP:journals/corr/abs-1210-2462** While at IST Austria I co-mentored one intern which resulted in **DBLP:conf/lata/ChatterjeeCR13** I am currently co-mentoring an undergraduate thesis at the University of Naples.

2017 **Undergraduate thesis (4 months)**, *University of Naples*, Topic: Graphical Games.

2012 **Summer undergraduate project (3 months)**, *IST Austria*, Topic: Edit-distance and Formal Languages.

2009 **Summer research experience for undergraduates (3 months)**, *Cornell University*, Topic 1: Parity Games; Topic 2: Automatic Structures with Advice.

Outreach

2010 I briefly volunteered at a secondary school in Accra, Ghana, teaching, observing and commenting on grade 5 mathematics classes.

2010 I briefly volunteered in Khayelitsha, South Africa, helping high-school students prepare for their mathematics exams.

2009 I taught two interactive lectures to non-mathematics majors at Cornell University on i) Hilbert's Hotel and Infinite Cardinals and ii) Algorithms and Termination.

Esteem

Invited Workshop Talks

2017 **Games of Imperfect-information with Public Actions**, *RoboLog, Rennes.*

2017 **Verification of Multi-Agent Systems with Imperfect Information and Public Actions**, *FMAI17, Naples.*

2012 **Finite and Algorithmic Model Theory**, *Les Houches, France.*

2011 **Automata theory and Applications**, *IMS programme, Singapore.*

2008 **Computational Model Theory**, *CNRS SIG, Bordeaux, France.*

2007 **Algorithmic-Logical Theory of Infinite Structures**, *Dagstuhl, Germany.*

2006 **Finite and Algorithmic Model Theory**, *Newton Institute, England.*

2004 **Workshop on Automata, Structures and Logic**, *Auckland, New Zealand.*

Graduate and School courses

2017 **10 hour PhD mini-course**, *Games on Graphs*, University of Naples, Duties: designed and presented.
9 attendants

2009 **1 semester PhD course**, *Logical Definability and Random Graphs*, Cornell University, Duties: designed and presented.
5 attendants

2006 **5 day advanced course**, *Logic and Computation in Finitely Presentable Infinite Structures*, European Summer School in Logic, Language and Information (ESSLLI 2006), Duties: designed and presented with Valentin Goranko.
approx. 20 attendants

Mentoring PhD students

2015 Closely worked with PhD students of Aniello Murano, and produced **DBLP:conf/atal/AminofMMR16**, **AMMR16-SR**, **GMRS16IJCAI**

2007 Closely worked with a PhD student of Erich Gradel's and solved a 12-year open problem **DBLP:conf/stacs/GanzowR08**

Chairs, Organisation, Committees

2018 PC member of the AAAI Conference on Artificial Intelligence (AAAI)

2017 Co-chair of the Italian Conference on Theoretical Computer Science (ICTCS)
`http://ictcs2017.unina.it/`

2017 Co-chair of the International Workshop on Strategic reasoning (SR)
`http://sr2017.csc.liv.ac.uk/`

2017 Co-organiser of the Italian Conference on Computational Logic (CILC)
`http://cilc2017.unina.it/`

2017 Co-organiser and -chair of the First Workshop on Formal Methods in AI (FMAI)
`https://sites.google.com/site/fmai2017homepage/`

2017 PC member of the International Joint Conference on Artificial Intelligence (IJCAI)

2017 PC member of the AAAI Conference on Artificial Intelligence (AAAI)

2017 PC member for IRISA Master Research Internship

2016 PC member of the International Workshop of Strategic Reasoning (SR)

2016 PC member of the International Symposium on Games, Automata, Logics and Formal Verification (GandALF)

2016 PC member of the European Conference on Artificial Intelligence (ECAI)

2013 Co-organiser of the IST Austria Young Scientist Symposium on the topic 'Understanding Shape: in silico and in vivo'
`ist.ac.at/young-scientist-symposium-2013/`

2012 Founded the computer science seminar at IST Austria whose goal was to foster collaborations within the institute between computer scientists and, at the time, biologists.
`ist.ac.at/computer-science-seminar/`

Project co-ordinator

2013-2016 Handbook of Model Checking, to be published by Springer, and edited by Edmund Clarke, Thomas Henzinger, Helmut Veith and Roderick Bloem. Duties included: assisted editors in managerial, organisational, and technical matters, including: organising reviews, reviewers, and copy-editors; liasing between editors and Springer editor. `http://www.springer.com/us/book/9783319105741`

Reviewing

Book Handbook of Model Checking

Journals Artificial Intelligence, Journal of Symbolic Logic, Logical Methods in Computer Science, Theory of Computing Systems, Central European Journal of Mathematics, Information and Computation, Journal of Logic and Computation, Annals of Mathematics and Artificial Intelligence, Theory and Practice of Logic Programming

Conferences IJCAI, KR, AAMAS, AAAI, EUMAS, ECAI, LICS, STACS, ICALP, MFCS, CONCUR, CSL, FoSSaCS, FSTTCS, SR, KRR@SAC, CiE, GandALF, RV, LPAR, LATA

Recent Research Visits

2016,2017 **Host: Mike Wooldridge, Oxford University**, *Topic: Rational Synthesis*.

2016,2017 **Host: Alessio Lomuscio, Imperial College London**, *Topic: Strategic-Epistemic logics for Multi-Agents Systems*.

2016 **Host: Diego Calvanese and Marco Montali, University of Bolzanno**, *Topic 1: Data-aware strategic logics; Topic 2: Knowledge Representation for Business Process Management*, Talk: Removing partial observability from generalised planning.

2016 **Hosts: Frank Stephan and Sanjay Jain, National University of Singapore**, *Topic: Learning Theory and Verification*.

2015,2016 **Host: Giuseppe De Giacomo, Sapienza, Rome**, *Topic 1: Synthesis under Assumptions; Topic 2: Generalised Planning with Partial Observability*.

2015 **Host: Helmut Veith, TU Wien**, *Topic 1: Logic and Impossibility Results in Distributed Computing; Topic 2: Abstractions for Fault-tolerant Distributed Algorithms*.

Refereed Publications

The cited bibliometrics are as follows: conferences are given their CORE (`http://portal.core.edu.au/conf-ranks/`) letter ranking, followed by the acceptance rate, followed by the number of submissions; journal are given their SJR letter ranking (`http://www.scimagojr.com/journalrank.php`) at time of publication (or nearest ranked year). These bibliometrics are a measure of conference/journal influence and do not, apriori, accurately reflect the quality of an individual paper.
In summary: I have 16 articles in CORE A* conferences, 7 in CORE A conferences, 4 in CORE B conferences; and 4 articles in Q1 journals, 2 articles in Q2 journals, 1 book, and 1 book chapter.

References

Teaching

Mentor **Maria Terrell**, *Director of Teaching Assistant Programs*, Cornell University.
maria@math.cornell.edu

Mentor **David Way**, *Associate Director of Instructional Support*, Center for Teaching Excellence, Cornell University.
dgw2@cornell.edu

Supervision

Mentor **Bob Strichartz**, *Department of Mathematics*, Cornell University.
str@math.cornell.edu

Academic

Previous Employer **Roderick Bloem**, *Institute for Applied Information Processing and Communication*, Technische Universität Graz.
roderick.bloem@iaik.tugraz.at

Current Collaborator **Giuseppe De Giacomo**, *Dipartimento di Ingegneria Informatica, Automatica e Gestionale*, Sapienza Università di Roma.
degiacomo@dis.uniroma1.it

Past Collaborator **Erich Grädel**, *Mathematische Grundlagen der Informatik*, RWTH Aachen.
graedel@logic.rwth-aachen.de

PhD Supervisor **Bakhadyr Khoussainov**, *Department of Computer Science*, University of Auckland.
bmk@cs.auckland.ac.nz

Current Collaborator **Alessio Lomuscio**, *Faculty of Engineering, Department of Computing*, Imperial College London.
a.lomuscio@imperial.ac.uk

Current Employer **Aniello Murano**, *Dipartimento di Ingegneria Elettrica e Tecnologie dell'Informazione*, Università degli Studi di Napoli "Federico II".
murano@na.infn.it

Past Collaborator **Frank Stephan**, *School of Computing*, National University of Singpore.
fstephan@comp.nus.edu.sg

Current Collaborator **Michael Wooldridge**, *Department of Computer Science*, University of Oxford.
mjw@cs.ox.ac.uk