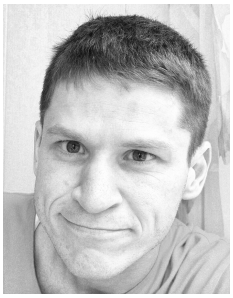
Ayrat Khalimov



Université Libre de Bruxelles, Belgium
ayrat.khalimov@gmail.com
Date of birth: Sep 27, 1986.

Research Interests

Formal methods, reactive synthesis, register automata, parameterized synthesis.

Research Experience

August 2019 – now	Post-doc (with E.Filiot) at ULB, Belgium *Topic: synthesis of data transducers.*
March 2018 – Oct 2018	Post-doc (with O.Kupferman) at Hebrew University, Israel *Topic: register-bounded synthesis.*
Jan 2012 – Jan 2018	PhD (with R.Bloem) at Graz University of Technology, Austria *Thesis "Reactive Synthesis: Branching Logics and Parameterized Systems"*
Apr 2011 – Sep 2011	Internship at Dependable Systems Lab, EPFL, Switzerland *Topic: symbolic execution (KLEE).*

Work Experience

March 2009 – Dec 2010	C# dev (full-time)	Consult Invest, Moscow, Russia
Aug 2007 – Aug 2008	C++ dev (part-time)	CellTroy Technologies, Moscow, Russia
Aug 2006 – Aug 2007	Java dev (part-time)	Institue of Precision Mechanics, Moscow, Russia

Education

July 2007 – July 2009	Master from Moscow Institute of Physics and Technology, Russia *Thesis "An Approach to Compute Cell Leakages"*
Sep 2003 – July 2007	Bachelor from Moscow Institute of Physics and Technology, Russia Study subject: Applied Physics and Mathematics *Thesis "Computer Simulation of Sensor Networks"*

Software

All the tools are available at https://github.com/5nizza/:

- PARTY: synthesizer from LTL and CTL* (winner at SYNTCOMP'17) (`python`).
- SDF: synthesizer from AIGER format and symbolic bounded synthesizer (`c++`).
- I maintain and contribute LTL benchmarks for the synthesis competition SYNTCOMP: https://github.com/SYNTCOMP/benchmarks/

Teaching

- 2020–2022: TA in the semester course "Embedded Systems Design", at ULB, Belgium.
- 2020–2022: TA in the semester course "Formal Methods", at ULB, Belgium.
- 2013–2017: TA and lectures in the semester course "Selected Topics in Design and Verification", TU Graz, Austria.
- 2013–2017: TA in the semester course "Verification and Testing", TU Graz, Austria.

Community Service

- Reviewer for CAV'12, FMCAD'12, CAV'13, FMCAD'13, FoSSaCS'13, Acta'14, CAV'15, CONCUR'15, CAV'16, AAMAS'16, IPL'16, ICTCS'17, SAS'17, DATE'17, VMCAI'17, FMCAD'17, ATVA'18, CAV'18, FMCSD'18, TCS'18, Acta'19, TACAS'19, CAV'19, SYNT'20, CONCUR'20, LICS'20, CONCUR'21
- Helped with GandAlf'20 conference: https://di.ulb.ac.be/verif/gandalf2020/
- Co-organizer of RiSE workshop http://arise.or.at/rise-workshop-2016/

Five Selected Publications

- **Decidability of Parameterized Verification**, 2015.
  Authors: Roderick Bloem, Swen Jacobs, Ayrat Khalimov, Igor Konnov, Sasha Rubin, Helmut Veith, Josef Widder.
  This book surveys and unifies existing work on parameterized model checking problem.
  My role: I wrote Chapter 7 on parameterized model checking of mobile networks.
- **Tight Cutoffs for Guarded Protocols with Fairness**.
  Conference: VMCAI (Verification, Model Checking, and Abstract Interpretation), 2016.
  Authors: Simon Außerlechner, Swen Jacobs, Ayrat Khalimov.
  My role: one of main investigators, co-writer.
- **Bounded Synthesis for Streett, Rabin, and CTL***.
  Conference: Computer Aided Verification (CAV), 2017.
  Authors: Ayrat Khalimov and Roderick Bloem.
  My role: lead investigator, co-writer.
- **Bounded Synthesis of Register Transducers**.
  Conference: Automated Technology for Verification and Analysis (ATVA), 2018.
  Authors: Ayrat Khalimov, Benedikt Maderbacher, Roderick Bloem.
  My role: lead investigator and writer.
- **Church Synthesis on Register Automata over Linearly Ordered Data Domains**.
  Conference: Symposium on Theoretical Aspects of Computer Science (STACS), 2021.
  Authors: Léo Exibard, Emmanuel Filiot, Ayrat Khalimov.
  My role: one of main investigators and writers.

Other Publications

Léo Exibard, Emmanuel Filiot, and Ayrat Khalimov. **Generic Solution to Register-Bounded Synthesis with Application to Discrete Orders**. In *International Colloquium on Automata, Languages and Programming (ICALP)*, 2022.

Ayrat Khalimov and Orna Kupferman. **Register-Bounded Synthesis**. In *Conference on Concurrency Theory (CONCUR)*, 2019.

Ayrat Khalimov. ***Reactive synthesis: branching logic & parameterized systems***. PhD dissertation, Graz University of Technology, 2018.

P. Klampfl, R. Koenighofer, R. Bloem, A. Khalimov, A. Abu-Yonis, and S. Moran. **OpenSEA: Semi-Formal Methods for Soft Error Analysis**. *ArXiv e-prints*, 2017.

Roderick Bloem, Sven Schewe, and Ayrat Khalimov. **CTL* Synthesis via LTL Synthesis**. In *Workshop on Synthesis (SYNT)*. 2017.

Roderick Bloem, Swen Jacobs, Ayrat Khalimov, Igor Konnov, Sasha Rubin, Helmut Veith, and Josef Widder. **Decidability in Parameterized Verification**. *SIGACT News*, 2016.

Ayrat Khalimov. **Specification Format for Reactive Synthesis Problems**. In *Workshop on Synthesis, SYNT*, 2015.

Benjamin Aminof, Swen Jacobs, Ayrat Khalimov, and Sasha Rubin. **Parameterized Model Checking of Token-Passing Systems**. In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2014.

Roderick Bloem, Swen Jacobs, and Ayrat Khalimov. **Parameterized Synthesis Case Study: AMBA AHB**. In *Workshop on Synthesis (SYNT)*, 2014.

Ayrat Khalimov, Swen Jacobs, and Roderick Bloem. **PARTY Parameterized Synthesis of Token Rings**. In *Computer Aided Verification (CAV)*, 2013.

Ayrat Khalimov, Swen Jacobs, and Roderick Bloem. **Towards Efficient Parameterized Synthesis**. In *Verification, Model Checking, and Abstract Interpretation (VMCAI)*, 2013.