



Personal information

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Homepage

Kafle Bishoksan

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Nepalese (Permanent Resident: Australia)

<http://akira.ruc.dk/~kafle>

Occupational field

Program analysis and verification, Abstract interpretation, Model checking, Constraint Solving, Programming languages

Relevant appointments

13.06.2016 -

Research Fellow in Computer Science, the University of Melbourne

- Analysis and verification of programs manipulating fixed-width arithmetic. Preconditions generation, decision procedures.
- Implementation of innovative tools supporting verification of programs with fixed-width arithmetic, precondition generation etc.

1.11.2015 - 1.06.2016

Research assistant in Computer Science, Roskilde University

- Analysis of requirements for tools supporting energy-aware software development.
- Implementation of innovative tools supporting verification of program properties.

01.03.2015 - 31.05.2015

Visiting researcher at NASA Ames research center, Intelligent system Division (<http://ti.arc.nasa.gov/>)

- Develop new techniques and tools for resource analysis of programs

1.07.2011 - 01.09.2011

Intern at Fondazione Bruno Kessler, Italy (<http://www.fbk.eu/>)

- Implementation of a knowledge store for storing memories such as photos, videos, lectures etc.

10.7.2009 - 1.10.2010

Software Developer at F1 Soft International (<http://www.f1soft.com>)

- Development of software for Banks and Telecommunication companies
- SMS applications, web development etc.

Research projects

- 1 **Analysing Computer Arithmetic to Improve Software Reliability**, ARC discovery project DP14010294 (involved 06.2016 - to date).
- 2 **ICT-Energy coordination action**, Funded by EU 7th Framework (involved 11.2015-06.2016).
- 3 **ENTRA: Whole-Systems Energy Transparency** (<http://entraproject.eu/>), Funded by EU 7th Framework (involved 12.2012-12.2015).
- 4 **Live Memories** (<http://www.livememories.org>), Funded by Autonomous Province of Trento, Italy (involved 07.2011-09.2011).

Education

01.12.2012 - 31.10.2015

Degree awarded on

Institution

PhD in computer science

08.11.2016

Roskilde University, Denmark

Topic
Supervisor

Components for Automatic Horn clause Verification.
John Gallagher (<http://akira.ruc.dk/~jpg>)

6.10.10 - 21.09. 2012

Institution

Masters in Computational Logic

EMCL (<http://www.emcl-study.eu/>): Technische Universität Dresden Germany (10.2010- 01.2011), Free University of Bolzano Italy (02.2011- 09.2011), Universidade Nova de Lisboa Portugal (10.2011-09.2012)

Thesis
Supervisors

Worst-case execution time of programs.
Pedro Barahona (FCT/UNL Portugal) and Franck Cassez (CNRS France, NICTA Australia)

9.04 - 3.09
Institution

Bachelor in Computer Science

Central University of Las Villas, Cuba UCLV

Languages

Nepali (mother tongue), English (fluent), Spanish (fluent), Portuguese (basic), Italian (basic), German (basic), Danish (basic), Hindi (basic)

Fellowships and Awards

- PhD fellowship from Roskilde University, 2012-2015
- **Best paper award**, ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation (PEPM'15)
- Exchange Student Scholarship (Masters) from Free University of Bolzano, 2011-2012
- Erasmus Mundus scholarship for European Master Program in Computational Logic, 2010-2012
- Nepalese Government scholarship for Bachelor in Computer Science, 2004-2009

Publications

Journals

- [2018] Bishoksan Kafle, John P. Gallagher, Graeme Gange, Peter Schachte, Harald Søndergaard & Peter J. Stuckey: An iterative approach to precondition inference using constrained Horn clauses. TPLP. 2018.
- [2018] Bishoksan Kafle, John P. Gallagher & Pierre Ganty: Tree dimension in verification of constrained Horn clauses. TPLP. 2018.
- [2018] John P. Gallagher, Mai Ajspur & Bishoksan Kafle: Optimised determinisation and completion of finite tree automata. J. Log. Algebr. Meth. Program. 2018.
- [2017] Bishoksan Kafle & John P. Gallagher : Constraint specialisation in Horn clause verification. Sci. Comput. Program. 2017.
- [2017] Bishoksan Kafle & John P. Gallagher : Horn clause verification with convex polyhedral abstraction and tree automata-based refinement, Journal of Computer Languages, Systems & Structures (COMLAN), 2017.
- [2016] Kerstin Eder, . . . , Bishoksan Kafle et. al: ENTR: Whole-systems energy transparency. Microprocessors and Microsystems - Embedded Hardware Design, 2016.

Conferences and workshops

- [2017] Bishoksan Kafle, Graeme Gange, Peter Schachte, Harald Søndergaard & Peter J. Stuckey: A Benders Decomposition Approach to Deciding Modular Linear Integer Arithmetic. SAT, 2017.
- [2016] Bishoksan Kafle, John P. Gallagher & José F. Morales: RAHFT: A tool for verifying Horn clauses using abstract interpretation and finite tree automata. CAV, Toronto, 2016.
- [2016] Bishoksan Kafle & John P. Gallagher: Interpolant tree automata and their application in Horn clause verification. VPT, Eindhoven, Netherlands, 2016
- [2016] Bishoksan Kafle, John P. Gallagher & Pierre Ganty: Solving non-linear Horn clauses using a linear Horn clause solver, HCVS, Eindhoven, Netherlands, 2016
- [2015] Bishoksan Kafle, John P. Gallagher & Pierre Ganty: Decomposition by tree dimension in Horn clause verification, VPT, London, UK, April 11, 2015. EPTCS, vol. 199, pp. 1-14.
- [2015] Bishoksan Kafle & John P. Gallagher: Constraint Specialisation in Horn Clause Verification, PEPM, Mumbai, India, January 15-17, 2015. ACM 2015, pp. 85-90 (**Best Paper Award**).
- [2015] Bishoksan Kafle & John P. Gallagher: Tree automata-based refinement with application to Horn clause verification, VMCAI, Mumbai, India, January 12-14, 2015. Springer, vol. 8931, pp. 209-226.
- [2014] Bishoksan Kafle & John P. Gallagher: Convex polyhedral abstractions, specialisation and property-based predicate splitting in Horn clause verification, HCVS, Vienna, Austria, July 17, 2014. EPTCS vol. 169, pp. 53-67.
- [2014] John P. Gallagher & Bishoksan Kafle: Analysis and Transformation Tools for Constrained Horn Clause Verification, ICLP, Vienna, Austria, July 19-22, 2014. TPLP vol. 14, Special issue 4-5 (Supplimentary Materials), pp. 90-101.

In progress

- B. Kafle, G. Gange, P. Schachte, H. Sondergaard & P. J. Stuckey: Word-level quantifier elimination and interpolation for modular arithmetic constraints.
- B. Kafle, G. Gange, P. Schachte, H. Sondergaard & P. J. Stuckey: Precondition Inference via Partitioning of Initial States.
- B. Kafle, G. Gange, P. Schachte, H. Sondergaard & P. J. Stuckey: Transformation-guided conditional non-termination.

Relevant softwares

- PIHORN: **A tool for generating preconditions based on Horn clauses**
- NTHORN: **A tool for generating non-termination preconditions based on Horn clauses**
- SoMoLIA: **A SOLver for MOdular Linear Integer Arithmetic**
- SoMoLIA-QE: **A tool for Quantifier elimination and Interpolation generation for modular linear integer arithmetic**
- RAHFT: **A tool for verifying Horn clauses using abstract interpretation and finite tree automata** (freely available from <https://github.com/bishoksan/RAHFT>)
- LHORN SOLVER: **A linear Horn clause solver for solving non-linear Horn clauses** (freely available from <https://github.com/bishoksan/LHornSolver>)
- Others (<https://github.com/bishoksan/>)

Services

- Accessor: Australian Research Council
- Reviewing: CAV, SAS, ICLP, LOPSTR, VPT, HCVS, Journal of automated reasoning, Journal of computer science-Oxford university press.
- PC member: LOPSTR'17, VPT'18, HCVS'19

Research collaboration

- The university of Melbourne, Australia
- Monash university, Australia
- University of Bristol, UK
- XMOS Ltd., Bristol, UK
- IMDEA Software Institute, Madrid, Spain
- NASA Ames research center, California
- SRI International, California
- Roskilde university, Denmark

Teaching and Advising experience

- TA in the course Scientific computing, Fall 2014 at Roskilde University.
- projects supervision for bachelors and masters students at Roskilde University (8 groups in total 2013-2014).

Additional information

Personal interests

Cricket, hiking, volleyball, mountain climbing, traveling, learning languages, philosophy, reading, cooking etc.

Character

Good interpersonal and communication skills, good team player, social, adventurous etc.

Countries lived or worked

Australia, Denmark, Germany, Italy, Portugal, United States, Cuba etc.

References

Available on request