Bishoksan Kafle

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Professional Summary

- Result-oriented forward-thinking individual with demonstrated ability in academic research, in particular, automated software analysis and verification with 20+ peer-reviewed scientific publications and contribution to several state-of-the-art program analysers/verifiers.

- Excellent team player and strong builder of collaborations in different aspects of basic and applied research with 5+ international research projects participation, PC member/chair of 7 international conferences/workshops, reviewer of 4+ leading journals and accessor of ARC.

- Creative, focussed, detail-oriented and self-motivated individual with proven ability to lead projects and deliver results, and integrate easily in a multicultural and multilingual environment; with experience of working and studying in 5 different continents.

Relevant Skills

- **Research expertise**

  - Strong research expertise as evidenced by 15+ first-authored peer-reviewed scientific publications (citations: 185, h-index: 9, i10-index: 9) in program analysis and verification, gained prior, during and after my PhD in leading universities and research institutes.
  - Experience in large scale applied research as evidenced by participation in 5 international projects funded by the EU, ARC, Spanish and Italian government and working on resource analysis of avionic systems at intelligent system division, NASA.
  - Expertise in program analysis and verification as evidenced by serving as program committee member of 7+ conferences, reviewer of 4+ leading journals and an accessor of the ARC.
  - Strong programming (Java, C, C++, Python, Prolog, OCaml, SQL, web languages etc.), software engineering and data analysis skills as evidenced by several contributed research (`https://github.com/bishoksan`) and commercial (e-Sewa: https://esewa.com.np) tools, gained while working in industries and universities.

- **Communication and networking skill**

  - Strong communication skills as evidenced by 30+ scientific presentations along with several enriching teaching and supervision experience in computer science.
  - Strong networking skills as evidenced by 5+ active collaboration including in the US, EU, AU; 24+ co-authors and tool developers, gained while studying, working, participating in projects, attending conferences and meetings.

- **Project management and leadership skill**

  - Leadership skills as evidenced by chairing workshop and meetings, editing workshop volume, planning, designing and teaching courses and managing projects.

– Project management skills as evidenced by timely achievement of project milestones, publications of research outcomes and distribution of prototype tools.

- **Resource management and conflict resolution**

  – Resource management skills gained by setting up project websites and updating project evolution, creating document sharing repositories, supporting and guiding team members, preparing teaching materials and developing project ideas.

  – Resource management skills as evidenced by co-authoring, timely publications of scientific articles and release of tools.

  – Conflict resolution skills gained while resolving co-authorship, selectively publishing research outcomes and selecting appropriate tool licenses.

Work History

- **IMDEA Software Institute**   Madrid, Spain
  Research Fellow in Computer Science   2019-

  – Computational resource analysis and verification, and recurrence equations solving:

    * Excellent team work, collaboration and advanced knowledge of program analysis techniques led to 4 peer reviewed publications along with 3 state-of-the-art analysers PIHorn, NtHorn, Tagr-Solver, and

    * also contributed to funding worth EUR $200,000+$.

- **The University of Melbourne**   Melbourne, Australia
  Research Fellow in Computer Science   2016-2019

  – Analysis and verification of programs manipulating fixed-with arithmetic, preconditions generation, decision procedures:

    * Knowledge of current industry trends and team effort combined with expertise in constraint solving led to 6 peer reviewed publications along with 2 state-of-the-art constraint solvers SoMoLia, SoMoLia-QE, and 1 analyser PIHorn.

    * also contributed to an ARC Discovery project proposal worth AUD 1.5+ million.

- **Roskilde University**   Denmark
  Research Associate in Computer Science   Nov. 2015 - Jun. 2016

  – Strong communication and resource management skills enabled to help organize several activities (workshops, meetings, summer schools) to promote low energy computation and collaborate with the partners in the ICT-ENERGY consortia.

- **NASA Ames Research Center, Intelligent system Division**   California, USA
  Visiting Research Scientist   March 2015 - Jun. 2015

  – Excellent research environment under the guidance of world class researchers help plant the seed to the publication of 2 articles related to resource analysis and the development of resource analysis tool Tagr-Solver, which can be used for resource analysis of avionic systems.

- **Fondazione Bruno Kessler**   Italy
  Research Intern   Jul. 2011 - Sept. 2011

  – Driven by product and market knowledge, implemented a knowledge store in Java for storing live memories such as photos, videos, lectures etc.

- **F1 Soft International** — Nepal
  Software Developer — *2009-2010*
    - Contributed to e-Sewa (a popular payment gateway widely used in Nepal driven by business acumen) and also to the development of banking softwares, web and mobile applications.

Education

- **Roskilde University** — Denmark
  PhD in Computer Science — *2012 - 2016*
    - Thesis: *Components for Automatic Horn clause Verification* (Adv: Prof. J.P. Gallagher)
- **Dresden University of Technology** — Germany, Italy, Portugal
  European Masters in Computational Logic — *2010 - 2012*
    - Thesis: *Worst-case execution time of programs* (Adv: Prof. P. Barahona & F. Cassez)

Research Projects

- **ProCode Project** — Madrid, Spain
  Spanish Ministry of Research, Science and Innovation (Role: Research fellow) — *involved: 2019-*
- **Analysing Computer Arithmetic to Improve Software Reliability** — Melbourne, Australia
  ARC discovery project DP14010294 (Role: Research fellow) — *involved: 2016 - 2019*
- **ICT-Energy Coordination Action** — Denmark
  EU 7th Framework (Role: Research associate) — *involved: Nov. 2015- Jun. 2016*
- **ENTRA: Whole-Systems Energy Transparency** — Denmark
  EU 7th Framework (Role: PhD student) — *involved: Dec.2012- Dec. 2015*
- **LiveMemories: Active Digital Memories of Collective Lives** — Italy
  Provincia Autonoma di Trento (Role: MSc Intern) — *involved: Jul.2011- Sep. 2011*

Selected Publications (More [DBLP, Google Scholar])

Edited Books

B1. Hossein Hojjat & Bishoksan Kafle: *Proceedings 8th Workshop on Horn Clauses for Verification and Synthesis.* 2021. EPTCS vol. 344. ISSN: 2075-2180.

Refereed Journals

J1. Bishoksan Kafle, Graeme Gange, Peter J. Stuckey, Peter Schachte & Harald Søndergaard: *Transformation-enabled precondition inference.* TPLP. 2021 (to appear).

J2. Bishoksan Kafle, John P. Gallagher, Graeme Gange et al.: *An iterative approach to precondition inference using constrained Horn clauses.* TPLP. 2018.

J3. Bishoksan Kafle, John P. Gallagher & Pierre Ganty: *Tree dimension in verification of constrained Horn clauses.* TPLP. 2018.

J4. John P. Gallagher, Mai Ajspur & Bishoksan Kafle: *Optimised determinisation and completion of finite tree automata.* J. Log. Algebr. Meth. Program. 2018.

J5. Bishoksan Kafle & John P. Gallagher: *Constraint specialisation in Horn clause verification*. Sci. Comput. Program. 2017.

J6. Bishoksan Kafle & John P. Gallagher: *Horn clause verification with convex polyhedral abstraction and tree automata-based refinement.* J. Comp. Lang., Systems & Structures. 2017.

J7. Kerstin Eder, . . ., Bishoksan Kafle et. al: *ENTRA: Whole-systems energy transparency.* Microprocessors and Microsystems - Embedded Hardware Design. 2016.

Refereed Conferences and workshops

C1. Bishoksan Kafle, Graeme Gange, Peter Schachte, Harald Søndergaard & Peter J. Stuckey: *Lightweight Nontermination Inference with CHCs*. SEFM. 2021 (to appear).

C2. Bishoksan Kafle, John P. Gallagher, Manuel V. Hermenegildo et al.: *Regular Path Clauses and Their Application in Solving Loops*. HCVS. 2021.

C3. John P. Gallagher, Manuel V. Hermenegildo, Bishoksan Kafle et al.: *From Big-Step to Small-Step Semantics and Back with Interpreter Specialisation*. VPT/HCVS. 2020.

C4. Bishoksan Kafle, Graeme Gange, Peter Schachte, Harald Sondergaard & Peter J. Stuckey: *A Benders Decomposition Approach to Deciding Modular Linear Integer Arithmetic*. SAT. 2017.

C5. Bishoksan Kafle, John P. Gallagher & José F. Morales: RAHFT: A tool for verifying Horn clauses using abstract interpretation and finite tree automata. CAV. 2016.

C6. Bishoksan Kafle & John P. Gallagher: *Constraint Specialisation in Horn Clause Verification*. PEPM. 2015. (**Best Paper Award**).

C7. Bishoksan Kafle & John P. Gallagher: *Tree automata-based refinement with application to Horn clause verification*. VMCAI. 2015.

C8. John P. Gallagher & Bishoksan Kafle: *Analysis and Transformation Tools for Constrained Horn Clause Verification*. ICLP. 2014.

Additional information

- **Personal interests:** Traveling, Languages, Philosophy and Mysticism, Meditation, Mind power, Volunteering.

- **Character:** Good interpersonal and communication skills, good team player, social, adventurous.

- **Countries studied or worked:** Australia, Spain, Denmark, United States, Germany, Italy, Portugal, Cuba, Nepal.

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