Curriculum Vitae
Georgios Karachalias

(Last updated on May 29, 2020)

1 Contact Information

E-mail: gdkaracha@gmail.com
Website: https://gkaracha.github.io

2 Work Experience

2020 - present Software Engineer, Tweag I/O, France (remotely).

2019 - 2020 Postdoctoral Researcher, Department of Computer Science, KU Leuven.

3 Education

2014 - 2018 Ph.D. in Engineering: Computer Science, KU Leuven.
thesis: Extensions to Type Classes and Pattern Match Checking.
supervisor: prof. dr. ir. Tom Schrijvers

2007 - 2013 Diploma in Electrical and Computer Engineering, National Technical University of Athens.
thesis: Pattern Matching Exhaustiveness for GADTs.
supervisor: prof. dr. Nikolaos Papaspyrou
GPA: 8.06 / 10.00

4 Scientific Research

4.1 Summary

The main area of my research is the design and implementation of programming languages, with a focus on statically-typed languages. I believe that static types can contribute significantly to programmer productivity by allowing her to (a) eradicate bugs early in the development process, (b) express complex properties about her programs, and (c) guide the compiler to automatically generate repetitive pieces of code (boilerplate).

4.2 Research Topics and Interests

- Programming languages and systems
- Compiler construction
- Domain-specific Languages
- Functional languages, Haskell
- Software testing
- Software verification
- Software engineering
- Type and type-and-effect systems, checking, inference
- Program transformation and optimization
- Automated code generation

4.3 Research Publications

1. **Explicit Effect Subtyping**. Georgios Karachalias, Matija Pretnar, Amr Hany Saleh, Stien Vanderhallen, and Tom Schrijvers. In Journal of Functional Programming (JFP), 2020.

2. **How to Go Eff Without a Hitch: On Efficient Compilation from Eff to OCaml (Extended Abstract)**. Stien Vanderhallen, Georgios Karachalias, and Tom Schrijvers. In Proceedings of the 21st International Symposium on Trends in Functional Programming (TFP '20), Krakow, Poland, 2020.

3. **Bidirectional Type Class Instances**. Koen Pauwels, Georgios Karachalias, Michiel Derhaeg, and Tom Schrijvers. In Proceedings of the 12th ACM SIGPLAN International Haskell Symposium (Haskell '19), Berlin, Germany, 2019.

4. **Explicit Effect Subtyping**. Amr Hany Saleh, Georgios Karachalias, Matija Pretnar, and Tom Schrijvers. In Proceedings of the 27th European Symposium on Programming (ESOP '18), Thessaloniki, Greece, 2018.

5. **Elaboration on Functional Dependencies: Functional Dependencies Are Dead, Long Live Functional Dependencies!**. Georgios Karachalias and Tom Schrijvers. In Proceedings of the 10th ACM SIGPLAN International Haskell Symposium (Haskell '17), Oxford, UK, 2017.

6. **Quantified Class Constraints**. Gert-Jan Bottu, Georgios Karachalias, Tom Schrijvers, Bruno C. d. S. Oliveira and Philip Wadler. In Proceedings of the 10th ACM SIGPLAN International Haskell Symposium (Haskell '17), Oxford, UK, 2017.

7. **GADTs Meet Their Match: Pattern-matching Warnings That Account for GADTs, Guards, and Laziness**. Georgios Karachalias, Tom Schrijvers, Dimitrios Vytiniotis and Simon Peyton Jones. In Proceedings of the 20th ACM SIGPLAN International Conference on Functional Programming (ICFP '15), Vancouver, BC, Canada, 2015.

8. **Parallelizing the Floyd-Warshall Algorithm on Modern Multicore Platforms: Lessons Learned**. Students of the Parallel Processing Systems course, School of Electrical & Computer Engineering, National Technical University of Athens. In 5th Conference for students in Electrical and Computer Engineering (SFHMMY'12), Thrace, Greece, 2012.

5 Scholarships and Funding

9 March, 2016 Travel Grant for a Short Stay Abroad (Research visit to Prof. Stephanie Weirich, University of Pennsylvania), Fund for Scientific Research - Flanders (FWO K210316N). 1,188€ and travel expenses.

17 November, 2015 ACM SIGPLAN/PLMW 16 (Donor Funded) Student Travel Support for participation in the 43rd ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2016) and the Programming Languages Mentoring Workshop (PLMW), St. Petersburg, Florida, USA. $1,020.00.

6 Research Visits

1. Prof. Matija Pretnar, University of Ljubljana, Slovenia, 18 - 22 September, 2017.

2. Prof. Stephanie Weirich, University of Pennsylvania, Philadelphia, USA, 9 - 21 May, 2016.

3. Hon. Prof. Simon Peyton Jones, Microsoft Research Cambridge, UK, 22 - 25 June, 2015.

4. Hon. Prof. Simon Peyton Jones and Dr. Dimitrios Vytiniotis, Microsoft Research Cambridge, UK, 22 - 24 October, 2014.

7 Research Community Service

7.1 Program Committee Member

HIW 2020 12th Haskell Implementors' Workshop.

7.2   Reviewer for International Conferences, Workshops, and Symposia

IFL 2019   31st Symposium on Implementation and Application of Functional Languages.

WFLP 2018   26th International Workshop on Functional and (constraint) Logic Programming.

ICLP 2017   33rd International Conference on Logic Programming.

ESOP 2017   26th European Symposium on Programming.

ICFP 2016   21st ACM SIGPLAN International Conference on Functional Programming.

FLOPS 2016   13th International Symposium on Functional and Logic Programming.

PADL 2016   18th International Symposium on Practical Aspects of Declarative Languages.

PPDP 2016   18th International Symposium on Principles and Practice of Declarative Programming.

PPDP 2015   17th International Symposium on Principles and Practice of Declarative Programming.

MPC 2015   12th International Conference on Mathematics of Program Construction.

ML 2015   16th ACM SIGPLAN International ML Family Workshop.

7.3   Organizing Committee Member

IFL 2016   28th Symposium on Implementation and Application of Functional Languages.

7.4   Artifact Evaluation Committee Member

ICFP 2017   22nd ACM SIGPLAN International Conference on Functional Programming.

7.5   Student Volunteer

ICFP 2015   20th ACM SIGPLAN International Conference on Functional Programming.

8   Teaching Experience

8.1   Lab Assistant

2014 - 2017, 2019   Declarative Languages (Declaratieve Talen).
Compulsory course, Master of Engineering: Computer Science, KU Leuven.

8.2   Ph.D. Students, as Daily Advisor

2018 - 2022   Koen Pauwels
Advanced Type Systems for Implicit Programming
KU Leuven

2018 - 2022   Gert-Jan Bottu
A Unifying Framework for Type-directed Implicit Code Generation
KU Leuven

2017 - 2021   Ruben Pieters
The Expressivity of Purely Functional Models for Side-effects
KU Leuven

2016 - 2020   Klara Marntirosian
Automating Programming Language Mechanization
KU Leuven

2015 - 2020 Alexander Vandenbroucke
Harnessing Probabilistic Programming for Dynamic Network Problems
KU Leuven

8.3 MSc Students, as Thesis Advisor

2019 - 2020 Reinert Lemmens
Pattern Matching in KHC
KU Leuven

2018 - 2019 Brecht Serckx
Optimizations in the Eff Compiler
KU Leuven

2017 - 2018 Koen Pauwels
Bidirectional Type Class Instances
KU Leuven

2017 - 2018 Michiel Derhaeg
Implementation of Functional Dependencies
KU Leuven

2016 - 2017 Gert-Jan Bottu
Quantified Class Constraints in Haskell
KU Leuven

8.4 MSc Students, as Internship Advisor

Summer & Autumn 2019 Marton Bognar
NeColus Compiler Development
KU Leuven

Summer & Autumn 2019 Stien Vanderhallen
Eff Compiler Backend Development
KU Leuven

Summer 2015 Gert-Jan Bottu
E-Systant (online teaching assistant)
KU Leuven

9 Presentations

9.1 Invited Talks at Universities and Other Research Institutions

1. Exhaustiveness & Coverage Checking for GHC-flavoured Haskell, invited talk, PL Club, University of Pennsylvania, Philadelphia, USA, 20 May, 2016.

2. Functional Dependencies in System FC, invited talk, PLAST Lab, Department of Informatics and Telecommunications, University of Athens, Greece, 11 December, 2015.

3. Reasoning about GADT Pattern Matching in Haskell, invited talk, Microsoft Research Cambridge, UK, 22 October, 2014.

9.2 Presentations at Conferences and Symposia

1. GADTs Meet Their Match, 20th ACM SIGPLAN International Conference on Functional Programming (ICFP '15), Vancouver, BC, Canada, 2 September, 2015.

9.3 Outreach

1. Functional Dependencies in Haskell, Leuven Haskell User Group Meeting, KU Leuven, Belgium, 1 March, 2016.

2. Functional Dependencies in System FC, Dutch Functional Programming Day, Utrecht University, The Netherlands, 8 January, 2016.

3. GADTs Meet Their Match, Leuven Haskell User Group Meeting, KU Leuven, Belgium, 19 May, 2015.

10 Conference Attendance

POPL 2017 44th ACM SIGPLAN Symposium on Principles of Programming Languages, 18 - 20 January, 2017, Paris, France.

CPP 2017 6th ACM SIGPLAN Conference on Certified Programs and Proofs, 16 - 17 January, 2017, Paris, France.

IFL 2016 28th Symposium on Implementation and Application of Functional Languages, 31 August - 2 September, 2016, KU Leuven, Belgium.

PPS 2016 1st Workshop on Probabilistic Programming Semantics, 23 January, 2016, St. Petersburg, Florida, USA.

POPL 2016 43rd ACM SIGPLAN Symposium on Principles of Programming Languages, 20 - 22 January, 2016, St. Petersburg, Florida, USA.

CPP 2016 5th ACM SIGPLAN Conference on Certified Programs and Proofs, 18 - 19 January, 2016, St. Petersburg, Florida, USA.

FARM 2015 3rd ACM SIGPLAN International Workshop on Functional Art, Music, Modelling and Design, 5 September, 2015, Vancouver, British Columbia, Canada.

Haskell 2015 8th ACM SIGPLAN International Haskell Symposium, 3 - 4 September, 2015, Vancouver, British Columbia, Canada.

ICFP 2015 20th ACM SIGPLAN International Conference on Functional Programming, 31 August - 2 September, 2015, Vancouver, British Columbia, Canada.