Alejandro **Serrano Mena**

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Work Experience

Xebia Functional (formerly 47 Degrees)
Remote
LEAD SOFTWARE ENGINEER
July 2022 until now

- Development of courses on Ktor and SQLDelight
- Involvement in formal methods initiative
- Co-maintainer of the Arrow library

Tweag
Remote
SENIOR SOFTWARE ENGINEER
March 2022 - June 2022

- Audit of smart contracts targeting the Cardano blockchain

47 Degrees
Remote
SENIOR SOFTWARE ENGINEER
September 2019 - February 2022

- Development of the Arrow Analysis compiler plug-in

Universiteit Utrecht
Utrecht, The Netherlands
JUNIOR ASSISTANT PROFESSOR
November 2017 - September 2019

- Part of the *Software Technologies for Learning and Teaching* research group
- Basic Teaching Qualification (BKO)

IMDEA Software
Madrid, Spain
RESEARCH INTERN AND PH.D. CANDIDATE
June 2012 - September 2013

- Static analysis of resource usage using abstract interpretation and the Ciao Prolog system
- Part of the Energy Transparency (ENTRA) project, EU 7th Framework Program

Nublic
Madrid, Spain
COFOUNDER
Late 2011 - Early 2013

- Nublic aimed to bring privacy to systems traditionally "in the cloud", and combine it with existing home domotics

Google Summer of Code
DEVELOPER
Summer 2013, Summer 2011

- *Summer 2013*: implementing interactive editing for the `ghc-mod` Haskell Emacs plug-in
- *Summer 2011*: enhacing the EclipseFP plug-in for Haskell development in Eclipse

Institut d'Investigació en Intel.ligència Artificial, CSIC
Bellaterra, Barcelona, Spain
RESEARCH INTERN
Summer 2009

- Development of a web interface for Diplomacy game, within the DipGame project for creating autonomous Diplomacy players – see `dipgame.org`

Books (more information in `serranofp.com/#books`)

2023	**Functional Programming Ideas for the Curious Kotliner**, self-published
2022	**Practical Haskell**, Apress (first edition in 2014, second edition in 2019)
2022	**The Book of Monads**, self-published (first edition in 2018)
2018	**Type Error Customization for Embedded Domain-Specific Languages**, dissertation

Talks

I've given more than 30 talks in the topics of functional programming and formal methods, using Haskell and Kotlin as the main implementation languages. The entire list, including links to videos when available, can be found in `serranofp.com/#talks`.

Open Source (selected projects)

Kotlin

- Co-maintainer of *Arrow* (`arrow-kt.io`)
- Main developer of *Arrow Analysis*, a static analysis tools based on SMT solving
- *KopyKat* (`kopyk.at`), little utilities for more pleasant immutable data in Kotlin
- *Inikio*, better initial-style DSLs in Kotlin

Haskell

- *Mu-Haskell*, purely functional framework for building micro services
- *kind-generics*, datatype-generic programming for GADTs and higher-kinded types

Education

Ph.D. in Computing Sciences

Universiteit Utrecht   *November 2013 - April 2018*

- *Thesis:* Type Error Customization for Embedded Domain-Specific Languages
- *Supervisor:* Jurriaan Hage, *Promotor:* Johan Jeuring

Double Degree in Computer Science and Mathematics   *Average: 9.48/10*

Universidad Autónoma de Madrid   *2006 - 2012*

- 20 mentions of honor in Computer Science courses, 10 mentions of honor in Maths courses
- *Erasmus* exchange in Universiteit Utrecht

Primary and Secondary School   *Average: 10/10*

Colegio Arcángel Rafael, Madrid   *Until 2006*

- Highest grade in Madrid region for the University entry exam

Awards and Honors

2018	**Best PhD Thesis**, Department of Information and Computing Sciences	*Utrecht*
2014	**Third Prize**, ICFP Student Research Competition	*Gothemburg*
2013	**Invitation to attend**, First Heildelberg Laureate Forum	*Germany*
2012	**Third prize in "Entrepreneurship Lab"**, Parque Científico de Madrid	*Madrid*
2011	**Second prize in entrepreneurship competition**, Universidad Autónoma de Madrid	*Madrid*
2011	**Finalist**, Telefónica's Wayra Program	*Valencia*
2009	**Second prize**, CUPCAM (Madrid Programming Contest), led to participation in SWERC	*Madrid*
2009-10	**Excellence Scholarship**, project about ensembles, guided by Alberto Suárez	
2008-09	**Excellence Scholarship**, project about computation theory, guided by Roberto Moriyón	
2007-08	**Excellence Scholarship**, algorithm for optional matching in couples, guided by Andrei Jaikin	
2006-07	**Excellence Scholarship**, algebraic properties of the Rubik's cube, guided by Fernando Chamizo	
2006	**High School Excellence Award**, Madrid Regional Government	*Madrid*
2001	**Finalist**, Concurso de Primavera de Matemáticas	*Madrid*

Participation in Committees

2022	**Chair**, Haskell Symposium 2022	*Slovenia*
2019	**Program Committee**, Implementation and Application of Functional Languages 2019	*Singapore*
	Program Committee, Haskell Symposium 2019	*Germany*
	Technical Committee, LambdaWorld 2019	*Spain*
2018	**Artifact Evaluation Committee**, ICFP 2018	*United States*
	Program Committee, LambdaConf 2018	*United States*
2017	**Program Committee**, Haskell Implementors Workshop 2017	*United Kingdom*
2016	**Program Committee**, Haskell in Leipzig 2016	*Germany*

Peer-Reviewed Publications

2020   **A quick look at impredicativity**, Serrano A., Hage J., Vytiniotis D., Peyton Jones S. *Proceedings of the ACM on Programming Languages. ICFP'20.* **Best paper award**

Describing microservices using modern Haskell (experience report), Serrano A., Corpa F. *Haskell Symposium 2020.*

Heuristics-based Type Error Diagnosis for Haskell: The case of GADTs and local reasoning, Burgers J., Hage J., Serrano A.. *Proceedings of the 32th Symposium on the Impl. and Application of Functional Programming Languages. IFL 2020.*

2019   **An Inherently-Typed Formalization for Featherweight Java**, da Silva S., Serrano A., Geraldo R., Rauber A. *Brazilian Symposium on Programming Languages. SBLP 2019.*

Classes of Arbitrary Kind, Serrano A., Miraldo V.C. *Practical Aspects of Decl. Lang. PADL 2019.*

A compiler architecture for domain-specific type error diagnosis, Serrano A., Hage J. *Open Computer Science, Volume 9.*

2018   **Generic programming of all kinds**, Serrano A., Miraldo V.C. *Proceedings of the 11th ACM SIGPLAN International Symposium on Haskell. Haskell 2018.*

Sums of products for mutually recursive datatypes: the appropriationist's view on generic programming, Miraldo V.C., Serrano A. *Proceedings of the 3rd ACM SIGPLAN International Workshop on Type-Driven Development. TyDe 2018.*

Guarded impredicative polymorphism, Serrano A., Hage J., Vytiniotis D., Peyton Jones S. *Proceedings of the 39th ACM SIGPLAN Conference on Programming Language Design and Implementation. PLDI 2018.*

2017   **Constraint handling rules with binders, patterns and generic quantification**, Serrano A., Hage J. *Theory and Practice of Logic Programming. Volume 17, Special Issue 5-6 (33rd International Conference on Logic Programming). ICLP 2017.*

Type Error Customization in GHC: Controlling expression-level type errors by type-level programming, Serrano A., Hage J. *Proceedings of the 29th Symposium on the Impl. and Application of Functional Programming Languages. IFL 2017.*

Lightweight soundness for towers of language extensions, Serrano A., Hage J. *Proceedings of the 2017 ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation. PEPM 2017.*

2016   **Type Error Diagnosis for Embedded DSLs by Two-Stage Specialized Type Rules**, Serrano A., Hage J. *Proceedings of Programming Languages and Systems – 25th European Symposium on Programming. ESOP 2016.*

Type Directives and Type Graphs in Elm, Peijnenburg F., Hage J., Serrano A. *Proceedings of the 28th Symposium on the Impl. and Application of Functional Programming Languages. IFL 2016.*

Generic Matching of Tree Regular Expressions over Haskell Data Types, Serrano A., Hage J. *Practical Aspects of Declarative Languages. PADL 2016.*

2015   **Type families with class, type classes with family**, Serrano A., Hage J., Bahr P. *Proceedings of the 2015 ACM SIGPLAN Symposium on Haskell. Haskell '15.*

2014   **Resource Usage Analysis of Logic Programs via Abstract Interpretation Using Sized Types**, Serrano A., López-García P., Hermengildo M. *Theory and Practice of Logic Programming. Volume 14, Special Issue 4-5 (30th International Conference on Logic Programming). ICLP 2014.*

2013   **Sized Type Analysis for Logic Programs**, Serrano A., López-García P., Bueno F., Hermengildo M. *Theory and Practice of Logic Programming. Volume 13, Special Issue 4-5 Online Supplement (29th International Conference on Logic Programming). ICLP 2013.*

Energy Consumption Analysis of Programs Based on XMOS ISA-Level Models, Liqat U., Kerrison S., Serrano A., Georgiuo K., López-García P., Grech N., Hermenegildo M., Eder K. *Logic-Based Program Synthesis and Transformation. LOPSTR 2013.*

2010   **DipGame: a testbed for multiagent systems**, Fabregues A., Navarro D., Serrano A., Sierra C. *Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems. AAMAS '10.*