

# Germán Andrés Delbianco

IRIF - Institute de Recherche en Informatique Fondamentel  
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## Experience

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### IRIF - Université Paris Diderot

Paris, France

*Post-doctoral Researcher*

*since Sept. 2017*

- **Distributed Systems Verification.** Development of new formal verification techniques for **replicated data-structures** under **weak** and **causal consistency**. Designed novel operational and axiomatic semantics for **causal consistency**, and **causal memory**.

### IMDEA Software Institute

Madrid, Spain

*Research Associate (Ph.D. student)*

*Oct. 2011 – Aug. 2017*

- **Mechanized Verification of Wait-Free Concurrency.** Developed a novel **concurrent separation logic**, FCSL, designed for full-functional verification of **concurrent algorithms**. Developed new verification techniques for **wait-free concurrent data-structures**. All these developments were mechanized in the **Coq** proof assistant. The research conducted during the thesis resulted in 4 published articles in top programming languages international conferences: ICFP, OOPSLA, ESOP, and ECOOP.

### IMDEA Software Institute

Madrid, Spain

*Research intern*

*Dec. 2010 – Sep. 2011*

- **Program Verification with Control Effects.** Designed a new **separation logic** for *unstructured control-flow* (e.g., continuations and jumps), implemented in the **Coq** proof-assistant.

### INRIA. Centre de Sophia-Antipolis Méditerranée

Sophia-Antipolis, France

*Research intern with the PULSAR team*

*Apr. 2008– Oct. 2008*

- **Semantics of Synchronous Languages.** Designed the type system for the **Esterel**-based *synchronous programming language* LE. Developed a type-checker in **Haskell**, which was integrated into the compiler.

### Universidad Nacional de Rosario

Rosario, Argentina

*Teaching Assistant at the Computer Science Department*

*Aug. 2007 – Dec. 2010*

- Teacher Assistant for the **Data Structures and Algorithms**, **Functional Programming and Foundations of Programming Languages**, **Introduction to Category Theory**, and **Type Systems** courses. The responsibilities comprised: preparing, conducting and grading practice and lab sessions; monitoring and grading partial and final exams and giving occasional lectures.

## Education

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### Universidad Politécnica de Madrid

Madrid, Spain

*Ph.D. in Computer Science, Grade: Outstanding*

*2017*

Dissertation: *Hoare-style Reasoning with Higher-Order Control: Continuations & Concurrency.*

Advisor: Dr. Aleksandar Nanevski, IMDEA Software Institute

Universidad Nacional de Rosario

Rosario, Argentina

Licentiate in Computer Science, Final Grade: 8.87 / 10.

2010

(Bac. + 5 degree in Computer Science.)

Thesis: *Program Calculation with Applicative Functors*.

Advisors: Dr. rer. nat Alberto Pardo, UDELAR; Dr. Mauro Jaskelioff, UNR / CIFACIS - CONICET.

## Publications

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G. A. Delbianco, I. Sergey, A. Nanevski, and A. Banerjee. Concurrent data structures linked in time. In *31st European Conference on Object-Oriented Programming, ECOOP 2017*, 2017.

I. Sergey, A. Nanevski, A. Banerjee, and G. A. Delbianco. Hoare-style specifications as correctness conditions for non-linearizable concurrent objects. In *ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications, OOPSLA*, 2016.

A. Nanevski, R. Ley-Wild, I. Sergey, and G. A. Delbianco. Communicating state transition systems for fine-grained concurrent resources. In *Programming Languages and Systems - 23rd European Symposium on Programming, ESOP*, 2014.

G. A. Delbianco and A. Nanevski. Hoare-style reasoning with (algebraic) continuations. In *ACM SIGPLAN International Conference on Functional Programming, ICFP*, 2013.

G. A. Delbianco, M. Jaskelioff, and A. Pardo. Applicative shortcut fusion. In *Trends in Functional Programming, TFP*, 2011.

G. A. Delbianco and C. Enea. Verifying causally consistent key-value stores with causal cut mappings. *In submission*, 2019.

A. Nanevski, A. Banerjee, G. A. Delbianco, and I. Fábregas. Resource morphisms for specifying concurrent programs in separation logic. *In submission*, 2019.

## Software Projects & Tools

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**HTTcc: Main contributor.** A separation logic for a stateful functional programming language with high order control operators [ICFP'13]. Developed as a *shallowly-embedded* domain-specific language (DSL) in Coq/ssReflect. <http://delbian.co/httcc>

**FCSL: Contributor.** FCSL is the first completely formalized framework for mechanized verification of full functional correctness of fine-grained concurrent programs. It is implemented as an embedded DSL in the dependently-typed language of the Coq proof assistant [ESOP'14, OOPSLA'16, ECOOP'17]. <http://software.imdea.org/fcsl/>

## Academic Service

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**External Review Committee:** ICFP 2019

**External Reviewer:** ESOP 2019, TACAS 2019, POPL 2019 (ERC), LICS 2018, LICS 2015, ICFP 2013, MFCS 2012.

**Reviewer:** Science of Computer Programming (2019).

## Administrative Duties

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**IRIF: Verification Seminar:** Seminar Chair & Coordinator since September 2017.

**IMDEA Software Institute: Theory Lunch Seminar:** Seminar Chair & Coordinator. January 2012 – July 2012