

# MATÍAS TORO IPINZA

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## ABOUT ME

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I've worked ten years developing software for the aeronautic industry. I like to work on anything related with innovation. Currently I'm doing a postdoc in the DCC. My research interests are the following:

- Programming Languages
- Type-and-effect systems
- Gradual Typing
- Security Typing
- Verification of gradual programs
- Differential Privacy

## PUBLICATIONS

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**Abstracting Gradual References** 2020  
*Science of Computer Programming, volume 197, pp.1-65, October 2020, Elsevier*

**Gradual Parametricity, Revisited** 2018  
*Proceedings of the ACM on Programming Languages, volume 3, number POPL, pp.17:1-17:30, January 2019, ACM Press*

**Distinguished Paper Award**

**Type-Driven Gradual Security with References** 2018  
Matías Toro, Ronald Garcia, Éric Tanter  
*ACM Transactions on Programming Languages and Systems, volume 40, number 4, pp.16:1-16:55, November 2018, ACM Press*  
**Presented at POPL 2019**

**Type-Driven Gradual Security with References: Complete Definitions and Proofs** July 2018  
Matías Toro, Ronald Garcia, Éric Tanter  
*Technical Report TR/DCC-2018-4, July 2018, University of Chile.*

**A Gradual Interpretation of Union Types** August 2017  
Matías Toro, Éric Tanter  
*Proceedings of the 24th Static Analysis Symposium (SAS 2017), volume 10422, pp.382-404, New York City, NY, USA, August 2017, Springer-Verlag*

**Gradual Union Types—Complete Definition and Proofs** June 2017  
Matías Toro, Éric Tanter  
*Technical Report TR/DCC-2017-1, June 2017, University of Chile*

## Customizable Gradual Polymorphic Effects for Scala

October 2015

Matías Toro, Éric Tanter

*Proceedings of the 30th ACM SIGPLAN Conference on Object-Oriented Programming Systems, Languages and Applications (OOPSLA 2015), pp.935-953, Pittsburgh, PA, USA, October 2015, ACM Press*

## Gradual Polymorphic Effects—Complete Definition and Soundness Proof

July 2015

Matías Toro, Éric Tanter

*Technical Report TR/DCC-2015-2, July 2015, University of Chile*

## EDUCATION

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**Universidad de Chile, Chile**

March 2015 - July 2019

PhD in Computer Science

**Universidad de Chile, Chile**

March 2013 - December 2014

MS in Computer Science

**Universidad de Chile, Chile**

March 2002 - December 2007

Computer Engineering

## EXPERIENCE

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**Universidad de Chile, Chile**

July 2020 - Present

- Postdoc in the DCC

**Instituto Milenio Fundamentos de los Datos**

April 2019 - July 2020

- Postdoc in the IMFD

**Via56 S.A.**

August 2008 - March 2019

*Chief Engineer*

*Santiago, Chile*

- Design and development of aeronautical applications that are actually in use all across Chile and Ecuador, in more than 30 control towers.
- SIGO-VSO and SIGO-SOE. Aeronautic integrated systems for operational management.  
*Scala, PostgreSQL, React*
- NOTAM bank system. System for full administration and storage of the NOTAM (Notice To AirMen) of a country.  
*Scala, PostgreSQL*
- Electronic flight progress strips for control towers.  
*PHP, Symfony, PostgreSQL, Python, Javascript, HTML5*
- VITRO: application for the visualization of air traffic control.  
*C++, QT, PostgreSQL*
- IFIS: web application for pilots and aeronautical management.  
*Scala, PHP, Symfony, PostgreSQL, Python, Javascript, HTML5*
- AURA: application for AURA observatory that monitors flight tracks.  
*Javascript, HTML5 and Scala*
- Puntaje Nacional: community for high school students to prepare to the PSU test.  
*PHP, MySQL, Symfony, Python and Javascript*

**Universidad de Chile**

March 2019 - July 2019

*Graduate teaching assistant*

*Santiago, Chile*

- Graduate teaching assistant in Programming Languages II

**Universidad de Chile**

*Graduate teaching assistant*

March 2016 - July 2016

*Santiago, Chile*

- Graduate teaching assistant in Advance Programming in Scala

**Universidad de Chile**

*Graduate teaching assistant*

August 2014 - December 2014

*Santiago, Chile*

- Graduate teaching assistant in Programming Languages II

**Universidad de Chile**

*Graduate teaching assistant*

March 2013 - December 2013

*Santiago, Chile*

- Graduate teaching assistant in Algorithms and Data Structures

**Universidad de Chile - UDT**

*Software Engineer*

May 2007 - July 2008

*Santiago, Chile*

- Design and development of multiple web applications for the Faculty of economics and business, Universidad de Chile.

*PHP, MySQL, Symfony, Python, Turbogears and Javascript*

**Novared**

*Web Developer*

January 2007 - February 2007

*Santiago, Chile*

- Web development for Banchile.

*Java and javascript*

**Entel PCS**

*Internship*

July 2006 - November 2006

*Santiago, Chile*

- Web system for service monitoring.

*Python, Pylons and javascript*

**Universidad de Chile**

*Teaching assistant*

July 2006 - November 2006

*Santiago, Chile*

- Teaching assistant in Operating System

**Universidad de Chile**

*Teaching assistant*

March 2006 - June 2006

*Santiago, Chile*

- Teaching assistant in Computación I

**IDC Soluciones Informáticas**

*Internship*

January 2006 - February 2006

*Santiago, Chile*

- Research and proposal for the security architecture of Interamericana company.

**Universidad de Chile**

*Teaching assistant*

March 2004 - December 2004

*Santiago, Chile*

- Teaching assistant in Calculus I

## TECHNICAL STRENGTHS

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<b>Computer Languages</b>	Scala, Coq, Python, Java, C++, C, PHP, Javascript
<b>Frameworks</b>	Symfony, Play, React, Material-UI
<b>Databases</b>	MySQL, PostgreSQL, Redis, Mongo
<b>Tools</b>	SVN, GIT

## GRANTS, HONOURS AND AWARDS

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**Engineers Institute of Chile, Chile** *2009*

Marcos Orrego Puelma award. Prize awarded to the best graduate student of the Engineering School.

**ACM** *2006*

First place ACM International Collegiate Programming Contest, Chile.

Participate in the World Finals held in Japan 2007

**Universidad de Chile, Chile** *2002 - 2007*

Outstanding student