



# PATRICIA GUERRA BALBOA

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## EDUCATION

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### Master of Science in Mathematics

University of Santiago de Compostela

Sep. 2020 – July 2021

Santiago de Compostela, Spain

### Bachelor's Degree in Mathematics

University of Santiago de Compostela

Sep. 2016 – July 2020

Santiago de Compostela, Spain

## WORK EXPERIENCE

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### PhD Student Researcher

Chair of IT Security (PS), Karlsruhe Institute for technology

October 2021 – Nowadays

Karlsruhe, Germany

- Trajectory data privacy, theoretical aspects of data privacy and statistical disclosure control, Differential Privacy.

### High-level research technician

Universitat Politècnica de Catalunya

July 2021 – September 2022

Barcelona, Spain

- Short-term research project about Generating Synthetic Data with Differential Privacy Guarantees.

### High-level research technician

University of Santiago de Compostela

March 2021 – July 2021

Santiago de Compostela, Spain

- Studying and analysis of localization and cohomology on quasicohereent sheaves on schemes and associated spaces. Presentation about schemes package on Lean library

### Intern

Kidcode S.L.

July 2019 – August 2019

Vigo, Spain

- Scientific divulgator and teacher

## HONORS AND AWARDS

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### Best Poster Award Community Congress by Startup Secure

K.I.T. Gründer Schmiede

2023

### "Mellores expedientes" (Best records) Recognition

University of Santiago de Compostela

2016

## TEACHING EXPERIENCE

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### Teaching Assistance

#### Seminar Privacy und Technischer Datenschutz

Master's course in IT Security

Summer Semester 2022

Karlsruhe Institute for technology

#### Reading-Group Privacy Enhancing Technologies

Master's course in IT Security

Summer Semester 2022

Karlsruhe Institute for technology

#### Lecture on Trajectory Privacy

as part of the Lecture Series Privacy Enhancing Technologies (Master's course)

Summer Semester 2022

Karlsruhe Institute for technology

#### Seminar Privatsphäre und Sicherheit

Master's course in IT Security

Winter Semester 2022/23

Karlsruhe Institute for technology

#### Seminar Privacy und Technischer Datenschutz

Master's course in IT Security

Summer Semester 2023

Karlsruhe Institute for technology

#### Lectures on Differential Privacy

as part of the Lecture Series Privacy Enhancing Technologies (Master's course)

Summer Semester 2023

Karlsruhe Institute for technology

## Supervised Bachelor & Master Theses

**Privacy Analysis of Deep Graph Generative Models using M.I.A.s**  
Master's Thesis

2023  
Karlsruhe Institute for technology

## INVITED TALKS AND PRESENTATIONS

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**"Unlocking the potential of composition in DP"**

Invited talk in the COSIC Seminar

October 2023

KU Leuven

**"Composability properties of DP"**

Invited talk in the PROPOLIS project

July 2023

Karlsruhe Institute for technology

**"Graph-based trajectory LDP masking"**

Invited talk in the PROPOLIS project

July 2023

Karlsruhe Institute for technology

**"Publishing Trajectories: A Study on Privacy Protection"**

XVII Spanish Meeting on Cryptography and Information Security (RECSI22)

October 2022

University of Cantabria

**"Mathematics behind privacy"**

Invited talk in García Rodeja Seminar (CITMAGA)

June 2022

University of Santiago de Compostela

**"Anonymizing Trajectory Data"**

Invited talk in the PROPOLIS project

March 2022

SAP Labs France - Sophia Antipolis

**"Anonymizing Trajectory Data: Limitations and Opportunities "**

The Third AAI Workshop on Privacy-Preserving Artificial Intelligence (PPAI-22)

February 2022

Online Event

**"How sheaves theory can help air-controllers at an airport"**

Invited talk in S.I.I. (Seminario de iniciación a la investigación)

March 2021

University of Santiago de Compostela

## PUBLICATIONS

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- [1] P. Guerra-Balboa, À. Miranda-Pascual, J. Parra-Arnau, and T. Strufe. "Composition in Differential Privacy for General Granularity Notions". In: *37th IEEE Computer Security Foundations Symposium (CSF)* (2024).
- [2] À. Miranda-Pascual, P. Guerra-Balboa, J. Parra-Arnau, J. Forné, and T. Strufe. "SoK: Differentially Private Publication of Trajectory Data". In: *Proceedings on Privacy Enhancing Technologies 2023.2* (Apr. 2023), pp. 496–516. ISSN: 2299-0984. DOI: 10.56553/popets-2023-0065.
- [3] P. Guerra-Balboa, A. M. Pascual, J. Parra-Arnau, J. Forné, and T. Strufe. "Anonymizing Trajectory Data: Limitations and Opportunities". In: *The Third AAI Workshop on Privacy-Preserving Artificial Intelligence (PPAI-22)* (2022). URL: <https://aaai-ppai22.github.io/files/25.pdf>.
- [4] P. Guerra-Balboa, A. M. Pascual, J. Parra-Arnau, J. Forné, and T. Strufe. "La Publicacion de Trayectorias: un Estudio sobre la Proteccion de la Privacidad". In: *XVII Reunión española sobre criptología y seguridad de la información. RECSI 2022* 265 (2022), p. 127. DOI: 10.22429/Euc2022.028.
- [5] P. Guerra-Balboa. "Cómo la teoría de haces puede ayudar en la torre de control de un aeropuerto". In: *Actas do seminario de iniciación a la investigación*. ISSN: 2171-6536. Seminario de Iniciación a la Investigación. Instituto de Matemáticas da Universidade de Santiago de Compostela, 2021, p. 51. URL: [https://www.usc.gal/export9/sites/webinstitucional/gl/institutos/matematicas/descargas/Anuario\\_20\\_21\\_sii.pdf](https://www.usc.gal/export9/sites/webinstitucional/gl/institutos/matematicas/descargas/Anuario_20_21_sii.pdf).

## SPECIFIC FORMATION

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**Seminar in Scientific Communication**

National Institute of Science Communication (NaWik )

2023

Karlsruhe, Germany

**5th Interdisciplinary Summerschool on Privacy (ISP 2023)**

Radboud University

2023

Berg en Dal, the Netherlands

<b>Seminar in Schemes Theory (Algebraic Geometry)</b> University of Santiago de Compostela	2021 Santiago de Compostela, Spain
<b>Discrete Morse Theory course</b> R.E.T. In collaboration with U.S.C	2019 Santiago de Compostela, Spain
<b>Introduction to Ergodic Theory course</b> R.E.T. In collaboration with U.S.C	2019 Santiago de Compostela, Spain
<b>Course on scientific documents and presentations on LaTeX</b> University of Santiago de Compostela	2019 Santiago de Compostela, Spain
<b>Mechanical computer assisted design Campus</b> Carlos III de Madrid University	2014 Madrid, Spain

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## LANGUAGE

### **Spanish - Mother tongue**

### **English: B2.1 with Honors**

Trinity College London

### **German: B1**

Karlsruher Institut für Technologie

### **Galician: CELGA4**

Consellería de Educación, Xunta de Galicia

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## OTHER ACTIVITIES AND INFORMATION

**Foreign Exchange at Queen Mary's Grammar School** Walsall, England

**Programming:** R, MATLAB, Fortran, Sagemath and Python

**Volunteering:** Guide at "Camiño ao respecto". Xunta de Galicia