



# PATRICIA GUERRA BALBOA

[patricia.guerra.balboa@gmail.com](mailto:patricia.guerra.balboa@gmail.com)

<http://linkedin.com/in/patricia-guerra-balboa-5597a2195>

## EDUCATION

### 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

### PhD Student Researcher

Chair of Privacy and Security, Karlsruhe Institute for technology

- Differential Privacy and applications to location privacy and attack mitigation.

October 2021 – Nowadays

Karlsruhe, Germany

### High-level research technician

Universitat Politècnica de Catalunya

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

July 2021 – September 2022

Barcelona, Spain

### High-level research technician

University of Santiago de Compostela

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

March 2021 – July 2021

Santiago de Compostela, Spain

### Intern

Kidcode S.L.

- Scientific divulgator and teacher

July 2019 – August 2019

Vigo, Spain

## HONORS AND AWARDS

### Audience Award & Silver Medal in the FameLab Germany - regional heat

FameLab Germany

2024

### Best Poster Award Community Congress by Startup Secure

K.I.T. Gründer Schmiede

2023

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

University of Santiago de Compostela

2016

## TEACHING EXPERIENCE

### Lecturer, Privacy Enhancing Technologies

Master's course

Every Summer Semester, 2022–present

Karlsruhe Institute of Technology (KIT)

### Organizer, Seminar on Privacy and Technical Data Protection

Master's course in IT Security

Every Summer Semester, 2022–present

Karlsruhe Institute of Technology (KIT)

### Organizer, Seminar on Privacy and Security

Master's course in IT Security

Every Winter Semester, 2023–present

Karlsruhe Institute of Technology (KIT)

### Teaching Assistant, Reading Group on Privacy Enhancing Technologies

Master's course in IT Security

Summer Semester 2022

Karlsruhe Institute of Technology (KIT)

## Supervised Bachelor & Master Theses

<b>Measurement of Attack Resilience of Differential Privacy</b> Master's Thesis	2025 KIT
<b>Utility of Semantic Privacy Notions for Correlated Data</b> Master's Thesis	2024 KIT & UPC
<b>Analysis of Topological Privacy Notions</b> Frieder Haizmann Master's Thesis	2024 KIT
<b>LDP protection of trajectories based on dependency reduction</b> Jakob Schmid Bachelor's Thesis	2024 KIT
<b>Riemannian-based Clustering for Differential Private Location Publication</b> Felix Schludecker Master's Thesis	2023 KIT
<b>Privacy Analysis of Deep Graph Generative Models using M.I.A.s</b> Michel Bodé, Master's Thesis	2023 KIT

## INVITED TALKS AND PRESENTATIONS

<b>"¿Cómo pueden las matemáticas proteger tu privacidad?"</b> Peregrinando: International carrers in mathematics and physics workshop	December 2024 CITMAga & IGFAE
<b>"Unlocking the potential of composition in DP"</b> Invited talk in the COSIC Seminar	October 2023 KU Leuven
<b>"Publishing Trajectories: A Study on Privacy Protection"</b> XVII Spanish Meeting on Cryptography and Information Security (RECSI22)	October 2022 University of Cantabria
<b>"Mathematics behind privacy"</b> Invited talk in García Rodeja Seminar (CITMAGA)	June 2022 University of Santiago de Compostela
<b>"Anonymizing Trajectory Data: Limitations and Opportunities "</b> The Third AAAI Workshop on Privacy-Preserving Artificial Intelligence (PPAI-22)	February 2022 Online Event
<b>"How sheaves theory can help air-controllers at an airport"</b> Invited talk in S.I.I. (Seminario de iniciación a la investigación)	March 2021 University of Santiago de Compostela

## PUBLICATIONS

- [1] M. Lange, P. Guerra-Balboa, J. Parra-Arnau, and T. Strufe. "Balancing Privacy and Utility in Correlated Data: A Study of Bayesian Differential Privacy". In: *Proceedings of the VLDB Endowment* 18.11 (2025), pp. 4090–4103. ISSN: 2150-8097. DOI: 10.14778/3749646.3749679.
- [2] 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).
- [3] P. Guerra-Balboa, A. Sauer, and T. Strufe. "Analysis and Measurement of Attack Resilience of Differential Privacy". In: *Proceedings of the 23rd Workshop on Privacy in the Electronic Society. WPES '24*. ACM, 2024. ISBN: 9798400712395. DOI: 10.1145/3689943.3695046.
- [4] À. Miranda-Pascual, P. Guerra-Balboa, J. Parra-Arnau, J. Forné, and T. Strufe. "An overview of proposals towards the privacy-preserving publication of trajectory data". In: 23.6 (2024), pp. 3711–3747. ISSN: 1615-5262. DOI: 10.1007/s10207-024-00894-0.
- [5] 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.

## SPECIFIC FORMATION

---

<b>Seminar in Scientific Communication</b> National Institute of Science Communication (NaWik )	2023 Karlsruhe, Germany
<b>5th Interdisciplinary Summerschool on Privacy (ISP 2023)</b> 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 &amp; 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

## 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

## 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