

# Francesc Gispert

📍 Girona, Catalonia

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## Employment

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### Software engineer.

*Esperanto Technologies. Barcelona, Catalonia.*

*April 2022 – present.*

- Part of the team responsible for data-flow graph optimizations in an in-house machine learning (ML) compiler developed in C++17.
- Added support for new ML models (Vicuna, StarCoder, Stable Diffusion) to the company's software stack: implemented missing operators, fixed or reported compiler bugs and verified correctness.
- Analyzed model performance from execution traces in search of potential optimizations. Used Perfetto and internal tools for the visualization of events and of data allocation across the memory hierarchy.
- Designed, implemented, tested and documented algorithms for the detection of overlaps between sub-tensors allocated inside a common memory buffer following different patterns.
- Created Python scripts to adapt auto-regressive large language models in ONNX format (i.e., Protobuf messages) for industry-standard caching techniques and developed the cache handling logic for the inference server in C++17.
- Prepared unit and integration tests (for components of the ML compiler) using Google Test, together with configuration files for Pytest scripts.
- Co-mentored eight interns.

### Software engineering intern.

*Barcelona Supercomputing Centre (BSC). Barcelona, Catalonia.*

*July 2014 – September 2014.*

- Initial evaluation of graph partitioning techniques to optimize task scheduling in parallel applications.
- Wrote Python scripts to partition DOT graphs following different heuristics to compare against state-of-the-art techniques.

## Education

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### PhD programme in mathematics (incomplete).

*Concordia University. Montreal, Quebec.*

*September 2018 – December 2021.*

- Conducted research on specialized subfields of algebraic number theory, namely on  $p$ -adic Hodge theory and Iwasawa theory.
- Taught mathematics courses to university students enrolled in STEM and business degrees.
- Co-supervised two bachelor's theses in algebraic number theory.

### Master's degree in mathematics.

*Universität Regensburg. Regensburg, Germany.*

*October 2016 – August 2017.*

*Università degli Studi di Padova. Padua, Italy.*

*October 2017 – July 2018.*

- ALGANT programme: specialization in algebra, geometry and number theory.
- Recipient of a fellowship from *la Caixa Foundation* for postgraduate studies in Europe.
- Grade: 110/110.

### Bachelor's degrees in computer science and in mathematics.

*Centre de Formació Interdisciplinària Superior (CFIS).*

*Universitat Politècnica de Catalunya (UPC). Barcelona, Catalonia.*

*September 2012 – May 2016.*

- CFIS excellence programme to complete two bachelor's degrees simultaneously.
- Recipient of a full tuition fee waiver and an accommodation scholarship (based on academic merit).
- Grades: 9.59/10 and 9.56/10.

## Awards and prizes

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- CFIS Award (sponsored by Kernel Analytics and Hewlett–Packard) for the best academic record (ex-aequo) in the CFIS programme to obtain two bachelor’s degrees.  
*Universitat Politècnica de Catalunya (UPC). Barcelona, Catalonia.*
- Everis Award (sponsored by Everis) for the best academic record in the bachelor’s degree in computer science.  
*Universitat Politècnica de Catalunya (UPC). Barcelona, Catalonia.*
- Second prizes (two years) in the International Mathematics Competition for University Students (IMC), awarded to contestants in the top 30% (approximately).  
*Blagoevgrad, Bulgaria.*
- Prize for the best results in Catalonia’s university admission exam.  
*Fundació Catalunya–La Pedrera. Barcelona, Catalonia.*
- Bronze medal in the International Physics Olympiad (IPhO), awarded to contestants in the top 50% (approximately).  
*Tallinn, Estonia.*
- Bronze medal for the 12th position in the Spanish Olympiad in Informatics (OIE).  
*Barcelona, Catalonia.*

## Other activities

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| 2020–2021 | Member of the organizing committee of the Colloque Panquébécois des Étudiants de l’ISM, a conference for graduate students in Quebec’s departments of mathematics.                                                                                                                                                                                                                                                      |
| 2016–2019 | Member of the editorial board of the mathematics students’ journal TEMat, meant for students to publish summaries of their bachelor’s theses.                                                                                                                                                                                                                                                                           |
| 2012–2017 | Co-trainer of the Catalan and Spanish teams for the International Mathematical Olympiad (IMO) and co-organizer of several editions of the Catalan Mathematical Olympiad (OMC), the Spanish Mathematical Olympiad (OME) and the BarcelonaTech Math Contest (BTM) in a variety of roles over the years: deputy leader of participant teams, member of the local organizing committee or member of the jury, among others. |
| 2015–2016 | Advisor of first-year students in the CFIS programme, with a grant awarded based on academic merit.                                                                                                                                                                                                                                                                                                                     |
| 2014–2016 | Co-founder and co-editor of Arhimede Mathematical Journal (AMJ), publishing olympiad-like mathematics problems and solutions.                                                                                                                                                                                                                                                                                           |

## Language skills

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NATIVE:	Catalan.
FLUENT:	Castilian, English. <i>C2 level in the Common European Framework of Reference (CEF).</i>
INTERMEDIATE:	Italian.
BASIC:	French, German.

## Computer skills

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OPERATING SYSTEM:	Debian (GNU/Linux).
PROGRAMMING LANGUAGES:	C++, Python.
OTHER TOOLS:	Git, L <sup>A</sup> T <sub>E</sub> X, Docker images, Jira.