Noel Arteche

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Summary

I am a third-year **PhD student** in theoretical computer science at **Lund University** and the **University of Copenhagen**, under the supervision of **Susanna F. de Rezende** and **Jakob Nordström**. Before that, I graduated from the Master of Logic at the University of Amsterdam and obtained a BSc in Computer Science from the University of the Basque Country.

Research Interests

- computational complexity theory
- logic & proof complexity
- theoretical computer science
- philosophy of mathematics & mathematical practice

Education

Lund University & University of Copenhagen — Lund, Sweden / Copenhagen, Denmark
PhD in Theoretical Computer Science — 2022 –

- Supervised by Susanna F. de Rezende and Jakob Nordström, part of the Mathematical Insights into Algorithms for Optimization (MIAO) research group.
- Funded by the Wallenberg AI, Autonomous Systems and Software (WASP) program.
- Expected graduation date: 2027.

University of Amsterdam — Amsterdam, The Netherlands
MSc in Logic (120 ECTS) — 2020 – 2022

- Two-year master's program at the Institute for Logic, Language and Computation (ILLC). Courses in logic, theoretical computer science, mathematics and philosophy.
- Graduated *cum laude*, partially funded by the E. W. Beth Scholarship.
- **Thesis**: *Parameterized Compilability*
  Supervisors: Ronald de Haan (ILLC, University of Amsterdam) and Hubie Chen (King's College London).

University of the Basque Country — San Sebastián, Spain
BSc in Computer Science (240 ECTS) — 2016 – 2020

- Graduated first of my year, GPA: 9.43 (out of 10)
- Erasmus+ exchange at the KU Leuven (Belgium), during the academic year 2019-20.
- **Thesis**: *A Formal Language and Tool for QBF Family Definitions*
  Supervisors: Marc Denecker (KU Leuven), Matthias van der Hallen (KU Leuven), Montserrat Hermo (University of the Basque Country). Results presented at the QBF Workshop of the SAT 2020 conference (see [5]).

Research Papers

[1] **N. Arteche**, G. Carenini, and M. Gray, "Quantum automating $\mathbf{TC}^0$-Frege is LWE-hard", in *39th Computational Complexity Conference (CCC 2024)*.

[2] **N. Arteche**, E. Khaniki, J. Pich, and R. Santhanam, "From proof complexity to circuit complexity via interactive protocols", in *51st EATCS International Colloquium on Automata, Languages and Programming (ICALP 2024)*.

[3] **N. Arteche** and M. Hermo, "Towards the exact complexity of realizability for Safety LTL", *Journal of Logical and Algebraic Methods in Programming*, vol. 141, 2024.

[4] **N. Arteche** and M. Hermo, "Prime implicant enumeration via QBF solvers", in *QBF Workshop at the 24th International Conference on Theory and Applications of Satisfiability Testing*, 2021.

[5] **N. Arteche** and M. van der Hallen, "A formal language for QBF family definitions", in *QBF Workshop at the 23rd International Conference on Theory and Applications of Satisfiability Testing*, 2020.

Research Visits

McGill University — Montreal, Canada
Visiting graduate student hosted by Robert Robere. — June 2024

Institute of Mathematics of the Czech Academy of Sciences — Prague, Czech Republic
Visiting graduate student hosted by Erfan Khaniki. — February 2024

University of Oxford — Oxford, UK
Visiting graduate student hosted twice by Ján Pich. — July 2023 & September 2024

Simons Institute for the Theory of Computing, UC Berkeley — Berkeley, USA
Visiting graduate student for the semester-long *Meta-Complexity* program. — January 2023 – May 2023

Selected talks

- **Quantum Automating TC^0-Frege Is LWE-Hard**
  - **Proof Complexity Workshop** (Sep. 3-5, 2024) — September, 2024
    University of Oxford
  - **Meta-Complexity Reunion Workshop** (April 15-18, 2024) — April, 2024
    Simons Institute for the Theory of Computing, UC Berkeley
  - **Prague Logic Seminar** (February 12, 2024) — February, 2024
    Institute of Mathematics of the Czech Academy of Sciences
- **From Proof Complexity to Circuit Complexity via Interactive Protocols**
  - **Imperial-Oxford-Warwick Complexity Network Seminar** (May 16, 2024) — May, 2024

Summer Schools

DIMACS Summer School 2024: Frontiers in Complexity Theory — New Brunswick, USA
Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University — July 2024

EPIT Summer School 2023: Le Kaléidoscope de la Complexité — Île d'Oléron, France
French National Centre for Scientific Research (CNRS) — June 2023

Hilbert-Bernays Summer School on Logic and Computation — Göttingen, Germany
University of Göttingen — October 2020

Teaching Experience

- **Guest lecturer** at the University of Amsterdam — January 2024
  Meta-Complexity (6 ECTS · MSc course) – Main teacher: Ronald de Haan
- **Teaching Assistant** at Lund University — Spring 2023, 2024
  Advanced Algorithms (7.5 ECTS · MSc course) – Lecturer: Susanna F. de Rezende
- **Teaching Assistant** at Lund University — Fall 2022, 2023
  Constraint Programming (7.5 ECTS · MSc course) – Lecturer: Per Andersson
- **Teaching Assistant** at the University of Amsterdam — Spring 2022
  Computational Complexity (6 ECTS · MSc course) – Lecturers: Ronald de Haan and Jan Maly

Scholarships and Awards

- **Best Presentation Award at PROLE'23 (XXII Jornadas de Programación y Lenguajes 2023)** September 2023
  For the talk *An Open Problem on the Complexity of Realizability for Safety LTL*.
- **Evert Willem Beth Scholarship** 2021 – 2022
  Granted the E. W. Beth scholarship for my master's in logic at the University of Amsterdam.
- **Extraordinary BSc Degree Award & Kutxa Fundazioa Award** 2020
  Best Computer Science student at the University of the Basque Country.

Languages

Spanish (native speaker), **Basque** (native speaker), **English** (fluent, C2 level), **French** (fluent, C2 level).