Rémi DI GUARDIA

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Academic

2025	*Post-Doctorate in theoretical computer science* Theory of quantum programming languages. Supervised by Claudia Faggian, as well as Thomas Ehrhard, at Université Paris Cité (IRIF lab, PPS team).
2021 - 2024	*PhD in theoretical computer science*, successfully defended on Sepember 23, 2024 Identity of Proofs and Formulas using Proof-Nets in Multiplicative-Additive Linear Logic. Supervised by Olivier Laurent at École Normale Supérieure de Lyon (LIP lab, Plume team).
2019 - 2021	*Master of fundamental computer science at École Normale Supérieure de Lyon*, a top ranking French school giving a research-oriented diploma
2017 - 2019	*Student at École Centrale de Lyon*, a top ranking French engineering school giving a multi-field diploma Main subjects: Mathematics, Computer science, Systems Control, Civil Engineering, Mechanic of Deformable Solids, Fluids and Energy, English and Management.
2015 - 2017	*Undergraduated intensive courses in Mathematics and Sciences* with English to enter top French schools by a nation-wide competitive examination at Lycée Chateaubriand (classes préparatoires)
2015	*High school diploma in Sciences* with highest honours at Lycée Saint-Martin in Rennes (France) Main subjects: Mathematics, Physics, Biology, Philosophy, History, English.

Productions

Published at a peer-reviewed international conference

FSCD 2025	*Yeo's Theorem for Locally Colored Graphs: the Path to Sequentialization in Linear Logic* with Olivier Laurent, Lorenzo Tortora de Falco and Lionel Vaux Auclair (18 pages).
FSCD 2023	*Type Isomorphisms for Multiplicative-Additive Linear Logic* with Olivier Laurent (48 pages).

Presented at a peer-reviewed international workshop

TLLA 2025	*A Formalization of Multiplicative Proof-Nets in Rocq* with Olivier Laurent (6 pages).
TLLA 2023	*Sequentialization is as fun as bungee jumping* with Olivier Laurent, Lorenzo Tortora de Falco and Lionel Vaux Auclair (6 pages).
TLLA 2022	*Bottom-Up Sequentialization of Unit-Free MALL Proof Nets* with Olivier Laurent (8 pages).

Accepted in a journal (pending minor revisions)

LMCS	*Type Isomorphisms for Multiplicative-Additive Linear Logic* with Olivier Laurent, revised and extended version of the paper with the same name of FSCD 2023, submitted after invitation (78 pages).

Software Development

	Formalizing in Coq the proof-nets of multiplicative linear logic, available at github.com/RemiDiG/proofnet_mll (all proofs done, simplification in progress).

Talks

11/11/2025	*Bayesian Networks and Proof-Nets: the proof-theory of Bayesian Inference*, ArpiLYSM 2 School, Arpino.
29/10/2025	*Confluence of Cut-elimination and Rules commutations in Linear Logic*, Days 2025 of the GT Scalp, Vitry-sur-Seine.
09/10/2025	*Cut-Expansion in Proof-Nets of Multiplicative Linear Logic*, Joint seminar of the LCS and LDP groups, Lumini.
19/07/2025	*A Formalization of Multiplicative Proof-Nets in Rocq*, TLLA 2025, Birmingham.
18/07/2025	*Yeo's Theorem for Locally Colored Graphs: the Path to Sequentialization in Linear Logic*, FSCD 2025, Birmingham.
01/07/2025	*Identity of Proofs and Formulas in Linear Logic*, Journées PPS 2025, Paris.
16/05/2025	*Identity of formulas and proofs*, PACM∧N 2025, Rome.
12/05/2025	*Yeo's Theorem for Locally Colored Graphs: the Path to Sequentialization in Linear Logic*, Kickoff meeting of the IRN-LI, Rome.
03/04/2025	*A formalisation in Rocq/Coq of proof nets from linear logic*, Groupe de travail of the IGG team, Strasbourg.

28/01/2025	*A simple proof of sequentialization for proof-nets, and links with graph theory*, Groupe de travail of the Sémantique team, Paris.
24/06/2024	*Around Yeo's theorem*, Groupe de travail of the Plume team, Lyon.
14/03/2024	*Retractions in Multiplicative Linear Logic*, Seminar Chocola, Lyon.
01/03/2024	*Retractions in Multiplicative Linear Logic*, Seminar of the group Mathematical Foundations of Computation, Bath.
29/11/2023	*Retractions for Multiplicative Linear Logic*, Days 2023 of the GT Scalp, Orléans.
04/07/2023	*Type Isomorphisms for Multiplicative-Additive Linear Logic*, FSCD 2023, Rome.
01/07/2023	*Sequentialization is as fun as bungee jumping*, TLLA 2023, Rome.
27/06/2023	*Proof theory and linear logic*, PhD student's seminar of LIP, Lyon.
15/05/2023	*A simple proof of sequentialization for MLL proof nets*, Groupe de travail of the Plume team, Lyon.
10/10 - 07/11/2022	*Type isomorphisms for Multiplicative-Additive Linear Logic*, Groupe de travail of the Plume team, Lyon.
31/07/2022	*Bottom-Up Sequentialization of Unit-Free MALL Proof Nets*, Linearity - TLLA 2022, Haifa.

Teaching

2025	Co-Supervisor for Jérôme Evrard's Master 2 internship.
2023 - 2024	Supervisor for labs and tutorials in the Computer Science. Courses: *Computer architecture* (L2‡, 24h), *Logic* (L3†, 32h).
2021 - 2023	Supervisor for labs and tutorials in the Computer Science. Courses: *Compilation and program analysis* (M1†, 28h/year, 56h total), *Functional project* (L3†, 32h/year, 64h total).

† École Normale Supérieure de Lyon
‡ Université Claude Bernard Lyon 1

Experiences

2024	*Differential λ-Calculus and Differential Linear Logic, 20 Years Later* Participation as a student in this one-week school at CIRM in Marseille. Introduction to differential λ-calculus and differential linear logic, then consequences of this approach in various fields.
2022	*Mathematical Components School and Worshop* Participation as a student in this one-week school at the INRIA center of Sophia-Antipolis. I learnt about key principles and good practices of the SSReflect proof language and the Mathematical Components library for the proof assistant Coq.
2022	*Linear Logic Winter School* Participation as a student in this one-week school at CIRM in Marseille. Main concepts and results from linear logic, with both introductory lectures and talks about more advanced subjects.
2021	*Master 2 internship* (6 months) on the formalization in Coq of proof nets, supervised by Olivier Laurent at École Normale Supérieure de Lyon. In the Yalla library on linear logic, formally define proof nets and prove some of their main properties, in the multiplicative fragment of linear logic.
2020	*Master 1 internship* (3 months) on C_5-coloring of P_8-free graphs, supervised by Paweł Rzążewski (University of Warsaw) and Édouard Bonnet (École Normale Supérieure de Lyon) Search for necessary and sufficient conditions for a graph without path of length 8 to be C_5-colorable. Bibliographic study on the methods used in similar cases, then adaptation.
2019	*Internship* (2^{nd} year of engineer school, 3 months) at the insurance company AXA Refactoring then improving a code for extracting information from databases for GAREAT (a group for reinsuring in case of terrorism). Use of SAS to manipulate data, in the complex framework of insurance rules.
2018 - 2019	*Research project* about reinforcement learning at École Centrale Lyon, supervised by Alexandre Saidi of the LIRIS laboratory Study of reinforcement learning in a team of two, bibliographic research of the mainstream algorithms to find an optimal policy for a Markov decision scheme. Implementation in C++ and analysis of these algorithms in the case of a labyrinth containing rewards and punishments.
2018	*Internship* (1^{st} year of engineer school, 1 month) at Mottaz Industrie Full-time workman in the automobile field, whose duties included assembling and quality-checking.

2017 - 2018	*AI Programming project* at École Centrale Lyon, supervised by Benjamin Chouvion Project in Python in a team of six for implementing a board game (Pingouins) during a year, rewarded by the second prize Francis Leboeuf. I was in charge of implementing several AI and I also did some modeling.

Practical skills

Languages	French (mother tongue), English (TOEFL & CAE), German and Japanese both at beginner level.
Programming	Coq, Ocaml, Python, Matlab, C++, SQL.
Tools	Git, LaTeX, Libre Office, Microsoft Office.