



# Lelio Brun

## POSTDOCTORAL RESEARCH SCIENTIST IN COMPUTER SCIENCE

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## Education

### PhD in Computer Science

2020

ÉCOLE NORMALE SUPÉRIEURE - PSL RESEARCH UNIVERSITY

Paris, France

- Thesis: *Mechanized Semantics and Verified Compilation for a Dataflow Synchronous Language with Reset*
- Honors: GDR GPL accessit prize

### MSc in Computer Science (MPRI)

2016

UNIVERSITÉ PARIS CITÉ

Paris, France

- Honors: *summa cum laude*

### MSc in Aerospace Engineering

2013

ISAE-ENSMA

Poitiers, France

- exchange at ÉTS, Montréal, Canada
- 8 months internship at Sagem DS, Massy, France: C++ simulation software for helicopter piloting system tests
- 4 months internship at Thales, Le Haillan, France: C++ flight simulator for military trainer aircraft

## Experience

### Postdoctoral research scientist

Oct 2022 – Present

NII - ZT-IoT project

Tokyo, Japan

- Formal methods for the security analysis of IoT systems.

### Postdoctoral research scientist

Jan 2021 – Aug 2022

ISAE-SUPAERO - IpSC Team (DISC)

Toulouse, France

- Adding translation validation features to the LustreC Lustre to C compiler through the Frama-C platform.

### Postdoctoral research engineer

Jan 2020 – Dec 2020

ÉCOLE NORMALE SUPÉRIEURE / INRIA - PARKAS Team

Paris, France

- Adding enumerations and case analysis support to the Vélus Lustre to Assembly compiler verified with the Coq Proof Assistant.

### Software engineer

May 2014 – Aug 2014

ASTEK

Le Plessis Robinson, France

- Bug tracking and fixing in a large C++ codebase.

## Skills

**Programming** OCaml • Haskell • Rust • C • C++ • Java • Python • HTML / CSS • Javascript • SQL • LaTeX • Git

**Formal Methods** Coq Proof Assistant • Frama-C Software Analyzers • Tamarin Prover

**Languages** French (native) • English (fluent) • Japanese (beginner) • Spanish (beginner)

## Publications

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### Automated Security Analysis for Real-World IoT Devices

HASP'23

LELIO BRUN, ICHIRO HASUO, YASUSHI ONO AND TARO SEKIYAMA

### Equation-Directed Axiomatization of Lustre Semantics to Enable Optimized Code Validation

EMSOFT'23

LÉLIO BRUN, CHRISTOPHE GARION, PIERRE-LOÏC GAROCHE AND XAVIER THIRIOUX

 Best paper

### Faites-vous confiance à votre thermostat ?

Interstices

LÉLIO BRUN

### Mechanized semantics and verified compilation for a dataflow synchronous language with reset

POPL'20

TIMOTHY BOURKE, LÉLIO BRUN AND MARC POUZET

### Towards a Verified Lustre Compiler with Modular Reset

SCOPES'18

TIMOTHY BOURKE, LÉLIO BRUN AND MARC POUZET

### A Formally Verified Compiler for Lustre

PLDI'17

TIMOTHY BOURKE, LÉLIO BRUN, PIERRE-ÉVARISTE DAGAND, XAVIER LEROY, MARC POUZET AND LIONEL RIEG

## Teaching assistant

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2021/22	<b>Computer science</b> • 3rd year undergraduate	ISAE-SUPAERO
	<b>Languages translation</b> • 3rd year undergraduate	ENSEEIH
	<b>Functional programming</b> • 3rd year undergraduate	ENSEEIH
2020/21–21/22	<b>Transition systems - TLA+</b> • 3rd year undergraduate	ENSEEIH
2020/21	<b>Automata and lexical analysis</b> • 2nd year undergraduate	Université Paris Cité
	<b>Databases</b> • 3rd year undergraduate and 1st graduate	Université Paris Cité
	<b>Computer science concepts 2</b> • 1st year undergraduate	Université Paris Cité
	<b>Programming basics 2</b> • 1st year undergraduate	Université Paris Cité
2017/18	<b>Computability, decidability</b> • 2nd year undergraduate	Sorbonne Université
2016/17–18/19	<b>Programming languages and compilation</b> • 3rd year undergraduate	École normale supérieure

## Academic service

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2017	<b>student volunteer</b>	POPL	2020	<b>reviewer</b>	EMSOFT
	<b>student volunteer</b>	PLDI	2023	<b>reviewer and artifact reviewer</b>	OOPSLA
2018	<b>reviewer</b>	EMSOFT		<b>Program Committee member</b>	JFLA
2019	<b>WiP Committee</b>	EMSOFT	2024	<b>artifact reviewer</b>	ATVA
	<b>artifact reviewer</b>	ECRTS		<b>artifact reviewer</b>	CAV