

### Experience

#### Industry

- June 2016 – January 2018 **Scala backend developer**, *MFG Labs*, Paris, France  
MFG Labs is a consultancy and development company with a strong expertise in data and AI co-founded by Fields medalist Pierre-Louis Lions.
- Spearheaded the development of chatbot projects automating customer relations for our clients based on a concurrent and resilient design using the Akka Streams library.
  - Participated in the development of ad campaigns creation subsystems of a meta Demand-Side Platform (DSP) for Havas Group. DSPs are advertiser campaign management products used in AdTech that provide advertisers features for buying ad placements online in real time.
  - Tech stack: Scala (Typelevel ecosystem), Play framework, Akka Streams, PostgreSQL, Git, Linux.

#### Research

- 2018-2023 **PhD in Computer Science**, *Institut de recherche en informatique fondamentale (Université Paris Cité), Inria team Picube*, Paris, France  
Developed a library [4] in Agda, a dependently-typed functional language, formalising my thesis' results.
- 2018-2022 **Teaching**, *Université Paris Cité*, Paris, France
- Lectured the course on mathematical logic to second year students.
  - Teaching assistant for the following courses: algorithms and data structures, Java, C, and web technologies.
- January 2016 - April 2016 **4-month research internship**, *Institut de recherche en informatique fondamentale (Université Paris Cité)*, Paris, France
- On the Taylor expansion of  $\lambda$ -terms in the algebraic  $\lambda$ -calculus under the supervision of Prof. Michele Pagani.
  - Implementation in OCaml.
  - Work presented at the LINEARITY'16 workshop [3].
- Summer 2013 **3-month internship**, *Institut français des sciences et technologies des transports, de l'aménagement et des réseaux (IFSTTAR)*, Villeneuve-d'Ascq, France  
Developed a UI in C++/Qt in order to centralise data from an experiment aiming at improving the GPS precision.

### Technical skills

- Professional experience in **Scala** with the **Akka Streams** library and the **Typelevel** ecosystem on projects using **PostgreSQL**, **Git**, and **Linux**.
- Expert in **Agda**, a dependently-typed functional language inspired from Haskell and comparable to **Coq** or **Lean**.
- Fluent in other statically-typed functional languages such as **Haskell** and **OCaml**.
- Currently using **Python** on personal machine learning projects.
- Low-level languages: Using **Rust** on a personal 3D rendering engine project and notions of **C++**.

### Education

- 2018-2023 **PhD in Computer Science**, *Institut de recherche en informatique fondamentale (Université Paris Cité), Inria team Picube*, Paris, France  
On the open problem of defining higher algebraic structures in homotopy type theory (HoTT) under the supervision of Dr. Matthieu Sozeau and in collaboration with Dr. Eric Finster. [2] My results are formalised in Agda, a functional programming language with dependent types. Part of my work was published with my co-authors at LICS21 [5].
- 2014-2015 **MSc in Computer Science (Distinction)**, *University of Oxford*, Oxford, United Kingdom  
Master's thesis on the use of string diagrams in categorical quantum mechanics under the supervision of Dr. Jamie Vicary. [1]
- 2012-2015 **Diplôme d'Ingénieur**, *École nationale supérieure d'informatique pour l'industrie et l'entreprise (ENSIIE)*, Évry, France  
Grande école d'ingénieur whose curriculum focuses on computer science and applied mathematics.
- 2012-2013 **Bachelor's degree in Mathematics**, *Université d'Évry Val-d'Essonne*, Évry, France

### Languages

- English Proficient, *Lived one year in England*  
French Native language

## References

- [1] Antoine ALLIOUX. “Formalizing Geometrical Proofs”. MA thesis. Oxford, United Kingdom: University of Oxford, 2015. URL: <https://github.com/allioux/master-thesis-public>.
- [2] Antoine ALLIOUX. “Higher Structures in Homotopy Type Theory”. PhD thesis. Université Paris Cité, 2023. URL: <https://github.com/allioux/thesis-public>.
- [3] Antoine ALLIOUX. “Krivine Machine and Taylor Expansion in a Non-uniform Setting”. In: *Proceedings Fourth International Workshop on Linearity, LINEARITY 2016, Porto, Portugal, 25 June 2016*. 2016, pp. 24–32. DOI: 10.4204/EPTCS.238.3. URL: <https://doi.org/10.4204/EPTCS.238.3>.
- [4] Antoine ALLIOUX and Eric FINSTER. *Formalisation of Higher Structures in Homotopy Type Theory*. URL: <https://github.com/allioux/thesis-formalisation>.
- [5] Eric FINSTER, Antoine ALLIOUX and Matthieu SOZEAU. “Types are internal  $\infty$ -groupoids”. In: *2021 36th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*. IEEE. 2021, pp. 1–13.