Antoine ALLIOUX

Software Engineer

Experience

Industrial

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 λ-terms in the algebraic λ-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 ∞-groupoids". In: *2021 36th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS).* IEEE. 2021, pp. 1–13.