Nicolas Jeannerod

Curriculum Vitæ

Career

2021–now **Research Software Engineer** at Tweag I/O. I spent a year working for a client and building a dynamic analysis tool suite for smart contracts on Cardano, mostly in Racket. I then joined the internal High Assurance Software Group a year ago, where I worked towards a similar purpose on a different tool suite written in Haskell. I am now working for a client and implementing an improvement of a consensus algorithm. In parallel, I contribute to some internal projects. I am also a hive supporter, mentoring fellow engineers as well as following them and communicating on their behalf to other instances of the company.

2017–2021 (3½ years) **PhD in Computer Science** at IRIF (Université de Paris, France) with Ralf Treinen and Yann Régis-Gianas on the "Verification of Shell Scripts Performing File Hierarchy Transformations". This involved a more theoretical side working on extending feature tree logics and working on their decidability; and a more practical side implementing the actual analysis tooling, from a parser of Shell to a satisfiability solver for formulas in our logics. This effort led to the report of over 150 bugs on Debian packages.

2013–2017 (4 years) **ENS Graduate Degree** at the École normale supérieure (Paris, France). This is a research-oriented four-year program including the third year of bachelor, the two years of master and an extra year – in my case, a one year-long internship. The degree requires the validation of extra courses in addition to the bachelor and master.

2014–2016 (2 years) **Master's Degree in Computer Science** at the Université de Paris (France). The "Master Parisien de Recherche en Informatique" is a research-oriented master program in computer science whose purpose is to train future scientists through intensive exposure to contemporary research.

Interests

Abstract I like specifications, abstraction and modularisation. I firmly believe in strongly typed functional programming, compilers, formal methods and program verification.

Concrete I enjoy working on low-level objects – network, systems or code optimisation, for instance. I am not afraid to dig into standards and RFCs.

Packaging I try to write good code, well designed and documented, used in practice.

System On my free time, I administrate a Debian server providing websites, email, cloud, etc.

Talks I love teaching and giving talks and I am said to be good at it.

Languages

Main OCaml, POSIX Shell

Good Haskell, Racket, TEX/LaTEX

Natural Fluent in French and English

OK Web, C, Java, Python, other Lisp

Outside of Work

Music I spend a lot of time playing music (piano & clarinet mostly, but I love trying all kind of instruments), writing music and typesetting music (with LilyPond).

SCD I also spend an awful lot of time doing Scottish Country Dancing. This includes dancing it, teaching it, playing music for it and organising local and international events.

Personal Data

Name Often referred to as "Niols"

Age 30 years old

Cell Phone +33 6 01 64 48 38

E-mail nicolas@jeannerod.fr (or niols@niols.fr)

Website http://nicolas.jeannerod.fr (or http://niols.fr)

GitHub http://github.com/Niols

LinkedIn http://linkedin.com/in/nicolasjeannerod

Full Professional Experience

2021–now **Research Software Engineer** at Tweag I/O. I spent a year working for a client and building a dynamic analysis tool suite for smart contracts on Cardano, mostly in Racket. I then joined the internal High Assurance Software Group a year ago, where I worked towards a similar purpose on a different tool suite written in Haskell. I am now working for a client and implementing an improvement of a consensus algorithm. In parallel, I contribute to some internal projects. I am also a hive supporter, mentoring fellow engineers as well as following them and communicating on their behalf to other instances of the company.

2021 **Member of the organising committee** of CONFLANG, a workshop colocated with SPLASH in October 2021.

2017–2021 (3½ years) **PhD in Computer Science** at IRIF (Université de Paris, France) with Ralf Treinen and Yann Régis-Gianas on the "Verification of Shell Scripts Performing File Hierarchy Transformations". This involved a more theoretical side working on extending feature tree logics and working on their decidability; and a more practical side implementing the actual analysis tooling, from a parser of Shell to a satisfiability solver for formulas in our logics. This effort led to the report of over 150 bugs on Debian packages.

2016–2020 (4 years) **Teaching** at UFR Informatique (Université de Paris, France) including both practical and written exercises sessions for a total of 240h over 4 years. In addition to these hours in front of the students, the work included preparing materials and grading exams and projects.

2017 (3 months) **Google Summer of Code** with Aymeric Fromherz and Nikos Gorogiannis: "Verification and Testing of Heap-based Programs with Symbolic PathFinder".

2016–2017 (1 year) **Research Internship** at IRIF (Université de Paris, France) with Ralf Treinen and Mihaela Sighireanu: "Correctness of Linux Scripts".

2016 (6 months) **Research Internship** at IRIF (Université de Paris, France) with Ralf Treinen and Mihaela Sighireanu: "Towards Verification of Shell Scripts".

2015 (5 months) **Research Internship** in the Complogic team (McGill University, Montréal, Canada) with Brigitte Pientka in order to help with the development of the proof assistant Beluga.

2014 (3 months) **Research Internship** at the Institut de Mathématiques de Marseille (France) with Lionel Vaulx Auclair and Emmanuel Beffara: "On a logical counterpart of local non-determinism in classical realisability".

Full Education

2013–2017 (4 years) **ENS Graduate Degree** at the École normale supérieure (Paris, France). This is a research-oriented four-year program including the third year of bachelor, the two years of master and an extra year – in my case, a one year-long internship. The degree requires the validation of extra courses in addition to the bachelor and master.

2014–2016 (2 years) **Master's Degree in Computer Science** at the Université de Paris (France). The "Master Parisien de Recherche en Informatique" is a research-oriented master program in computer science whose purpose is to train future scientists through intensive exposure to contemporary research.

2013–2014 (1 year) **Bachelor's Degree in Computer Science** at the École normale supérieure (Paris, France). The two years of preparatory classes, completed by first year of the École normale supérieure, include a full bachelor.

2011–2013 (2 years) **Preparatory Classes MPSI/MP*** at the Lycée du Parc (Lyon, France). Preparatory Classes are an intensive two-year preparation for competitive entrance into top engineering and research schools.

Miscellaneous Experience

2022–now **President** of the RSCDS Paris Branch. I lead the organising committee and represent the branch in front of the members, the RSCDS and the other branches.

2019–now **Teacher** of Scottish country dance classes at the RSCDS Paris Branch.

2018–now **Musician** for Scottish country dance classes at the RSCDS Paris Branch and internationally.

2019–2021 **Editor** of the Paris Book of Scottish Country Dances, volume 2 as well as its two companion books of tunes. This involves communicating with the different authors, handling copyright considerations, typesetting the book (using LaTeX and LilyPond), printing and publishing it, etc.

2018–2022 **Member of the organising committee** of the RSCDS Paris Branch.

2018–2022 **Organiser and member of a professional band** (~2-3 musicians) playing at various events, mostly weddings. This includes finding the gigs, discussing the organisation with the clients and, of course, playing music.

2017–2022 **Organiser and member of an amateur band** (~10-12 musicians) playing for Scottish country dances.

Jan. 2017 **Student volunteer** at POPL in Paris, France.

Aug. 2012 **Sanitation worker** for the city of Mions, France.

2009–2011 **Member of the organising committee** of the Orchestre dHarmonie de Saint-Priest, an amateur wind orchestra, and its associated music school, Vive le Vent.

Selected Publications

2021 "**Verification of Shell Scripts Performing File Hierarchy Transformations**". Nicolas Jeannerod. PhD Thesis

2020 "**Analysing installation scenarios of Debian packages**". Benedikt Becker, Nicolas Jeannerod, Claude Marché, Yann Régis-Gianas, Mihaela Sighireanu and Ralf Treinen. In TACAS 2020 26th International Conference on Tools and Algorithms for the Construction and Analysis of Systems. Core Ranking 2020: A.

2020 "**Morbig: A Static parser for POSIX shell**". Yann Régis-Gianas, Nicolas Jeannerod and Ralf Treinen. In Journal of Computer Languages, Volume 57, April 2020.

2018 "**Morbig: A Static Parser for POSIX Shell**". Yann Régis-Gianas, Nicolas Jeannerod and Ralf Treinen. In SLE 2018 - 11th International Conference on Software Language Engineering. Core Ranking 2018: B.

2018 "**Deciding the First-Order Theory of an Algebra of Feature Trees with Updates**". Nicolas Jeannerod and Ralf Treinen. In IJCAR 2018 - 9th International Joint Conference on Automated Reasoning. Core Ranking 2018: A*.

2017 "**A Formally Verified Interpreter for a Shell-like Programming Language**". Nicolas Jeannerod, Claude Marché and Ralf Treinen. In VSTTE 2017 - 9th Working Conference on Verified Software: Theories, Tools and Experiments.

2017 "**Le coquillage dans le CoLiS-mateur**". Nicolas Jeannerod. In JFLA 2017 - 28e Journées Francophones des Langages Applicatifs.

Selected Talks

Mar. 2021 "**Verification of Shell Scripts Performing File Hierarchy Transformations.** ". At PhD Thesis Defence.

Dec. 2020 "**Analysing installation scenarios of Debian Packages.** ". At IRIF's Verification Seminar.

Sept. 2019 "**Symbolic Execution of Debian Packages.** ". At AVM'19.

Jul. 2019 "**Symbolic Execution of Maintainer Scripts.** ". With Ralf Treinen. At DebConf'19.

Jul. 2018 "**Mining Debian Maintainer Scripts.** ". With Ralf Treinen. At DebConf'18.

Jul. 2018 "**Deciding the First-Order Theory of an Algebra of Feature Trees with Updates.** ". At IJCAR'18.

Jun. 2018 "**Deciding the First-Order Theory of an Algebra of Feature Trees with Updates.** ". At IRIF's Verification Seminar.

Sept. 2017 "**Formalising an Intermediate Language for POSIX Shell.** ". With Yann Régis-Gianas. At Seminar Gallium.

Jul. 2017 "**A Formally Verified Interpreter for a Shell-like Programming Language.** ". At VSTTE'17.

Jul. 2017 "**A Formally Verified Interpreter for a Shell-like Programming Language.** ". At Seminar VALS.

Jan. 2017 "**Le coquillage dans le CoLiS-mateur.** ". At JFLA'17.

Teaching

Feb. 2020 (36h) "**Internet et outils**". Practical exercises at Université de Paris (France): Introduction to web programming in HTML5/CSS/PHP/MySQL/JS for first year students in computing.

Sept. 2019 (24h) "**Principe de fonctionnement des machines binaires**". Written exercises at Université de Paris (France): Introduction to binary, circuits and processors for first year students in computing.

Feb. 2019 (24h) "**Concepts informatiques**". Written exercises at Université de Paris (France): Introduction to compilation for first year students in computing.

Sept. 2018 (36h) "**Programmation fonctionnelle**". Practical exercises at Université de Paris (France): Introduction to functional programming in OCaml for third year students in computing.

Feb. 2018 (48h) "**Internet et outils**". Practical exercises at Université de Paris (France): Introduction to web programming in HTML5/CSS/PHP/MySQL/JS for first year students in computing.

Feb. 2018 (24h) "**Concepts informatiques**". Written exercises at Université de Paris (France): Introduction to compilation for first year students in computing.

Feb. 2017 (24h) "**Projet informatique**". Tutoring at Université de Paris (France): tutoring of second year students in computing during their programming project.

Sept. 2016 (24h) "**Introduction à la programmation**". Practical exercises at Université de Paris (France): Introduction to programming in Java for first year students in computing.