Pierre Cry

Currently seeking a postdoctoral position in the field of Process Mining

Current Position: **Ph.D. student at CentraleSupélec, Paris-Saclay**
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Current situation

I am currently in the final year of my Ph.D. in the ARCADE team (Apprentissage, Raisonnement, Calcul, Axiomatisation, Décision, Estimation) within the MICS laboratory (Mathématiques et Informatique pour la Complexité et les Systèmes) at CentraleSupélec, part of Université Paris-Saclay.

Education

2022 - 2025: **Ph.D.'s degree in Process Mining** — *CentraleSupélec, Paris-Saclay*
Development of stochastic process discovery methods — *Gif-sur-Yvette, France*

- Supervised by Paolo Ballarini and Pascale Le Gall
- MICS: Mathematics and Informatics

2019 - 2021: **Master's degree in Artificial Intelligence** — *UT3 Paul Sabatier*
Image and Audio analysis with Machine Learning — *Toulouse, France*

- *2021:* Master's internship supervised by Emmanuelle Claeys
  Application of process mining methods
  on datasets (logs) using statistics and machine learning.

2016 - 2019: **Bachelor's degree in Computer Science** — *INU Jean-François Champollion*
Programming, General and Theoretical computing — *Albi, France*

- *2019:* Bachelor's internship supervised by Alain Berthomieu
  Development of an isotope calculation algorithm.

2015 - 2016: **High School Diploma** — *Lycée Louis Rascol*
Scientific option (mathematics, physics, chemistry and life science) — *Albi, France*

Work experience

2021 - 2022: **Ingénieur de recherche** — *Université Paris-Est Créteil*
Simulation-based evaluation of clustered processes — *Créteil, France*

- Supervised by Benoit Barbot
- LACL: Laboratoire d'Algorithme, Complexité et Logique

Research activities

My research lies within the field of process mining, with a particular focus on process discovery. I design algorithms and methods for discovering stochastic process models, such as stochastic Petri nets and process trees, that accurately capture real-world business processes' structural and probabilistic behaviours. My work bridges model inference, formal methods, and statistical techniques to support robust, interpretable, data-driven representations of complex systems.

My contributions include methods for extracting the stochastic behaviours of a model via reachability unfolding, optimization procedures guided by distance metrics between observed and simulated behaviours, and Bayesian inference approaches for learning probabilistic parameters from event logs. These methods are designed to be both data-driven and interpretable, providing robust tools for understanding variability and uncertainty in complex systems.

Keywords: Process mining, Stochastic process discovery, Petri net, Process tree, Bayesian inference.

Publications

Publication in a international peer-reviewed journals:

- *2025:* **Pierre Cry**, András Horváth, Paolo Ballarini, Pascale Le Gall. "An efficient stochastic process discovery framework based on optimization". In: *Journal on Software Tools for Technology Transfer (STTT)*. **Under review**.

Publications in a international peer-reviewed conference:

- *2025:* **Pierre Cry**, András Horváth, Paolo Ballarini. "Stochastic Process Trees: A Formal Framework for Stochastic Process Discovery". In: *7th International Conference on Process Mining (ICPM)*, Oct 2025, Montevideo, Uruguay. **Forthcoming**.
- *2025:* **Pierre Cry**, Paolo Ballarini, András Horváth, Pascale Le Gall. "Statistical Bayesian Inference for Stochastic Process Discovery". In: *International Conference on Quantitative Evaluation of SysTems (QEST)*, Aug 2025, Aarhus (Danemark), Denmark. HAL ID: `hal-05134848`
- *2024:* Paolo Ballarini, Andras Horvath, **Pierre Cry**. "Probabilistic Process Discovery with Stochastic Process Trees". In: *Conference on Perfomance Evaluation and Optimization of Complex Systems*, Dec 2024, Milan, Italy. HAL ID: `hal-05021584`
- *2024:* **Pierre Cry**, Paolo Ballarini, András Horváth, Pascale Le Gall. "A framework for optimisation based stochastic process discovery". In: *Proceedings of the International Conference on Quantitative Evaluation of Systems and Formal Modeling and Analysis of Timed Systems*, Sep 2024, Calgary (Alberta), Canada. DOI: `10.1007/978-3-031-68416-6_3`

Publication in a national peer-reviewed conference:

- *2025:* **Pierre Cry**. "Découverte de processus probabiliste avec des arbres de processus stochastiques (Résumés longs)" In: *Journées Approches Formelles dans l'Assistance au Développement du Logiciel (AFADL 2025). Approches Formelles dans l'Assistance au Développement du Logiciel*, Jun 2025, Pau, France. HAL ID: `hal-05106227`

Talks and Presentations

International conference:

- *2024:* QEST 2024 (International Conference on Quantitative Evaluation of SysTems), 9 September 2024, Calgary (Alberta), Canada.
  LINK: `https://www.qest.org/qest-formats-2024`

National conference:

- *2025:* AFADL 2025 (Approches Formelles pour l'Assistance au Développement de Logiciels), 17 June 2025, Pau, France.
  Link: `https://gdrgpl2025.sciencesconf.org`

Presentation in research working group:

- *2024:* MeFoSyLoMa Seminar, 4 Octorber 2024, Gif-sur-Yvette.
  Link: `https://mefosyloma.fr`

Presentations in laboratory and team seminars:

- *2024:* ARCADE team seminar, 14 June 2024. Gif-sur-Yvette.
  Link: `https://arcade.pages.centralesupelec.fr/`
- *2023:* MICS laboratory seminar, 14 December 2023. Gif-sur-Yvette.
  Link: `https://www.mics.centralesupelec.fr`

Popularization and science communication competitions:

- *2025:* Doctoral school "Défi 10 minutes", 27 Mars 2025. Gif-sur-Yvette.
  First place in the thesis popularization contest organized by the doctoral school. Presented the core ideas of my Ph.D. project to a general audience in under 10 minutes. Inspired by the "Three Minute Thesis" format.
- *2024:* French Paris-saclay final three minute thesis, 14 Mars 2024. Gif-sur-Yvette.
  Finalist in the Paris-Saclay University local round of the French "Three Minute Thesis" competition, presenting my doctoral research to a non-specialist audience in under three minutes.

Teaching

All of my teaching activities were conducted at CentraleSupélec during my Ph.D. thesis. I have currently thought for 198 hours since 2022, in tutorial and practical sessions:

Algorithms	54 hours
Basic programming in Python	126 hours
Object-oriented programming in Java	18 hours

Collective and administrative responsibilities

2024: Elected Doctoral Student Representative, Laboratory Board, MICS.

2023: Helpers for the organisation of the conference *ETAPS 2023*, April 2023, Paris, France.

Event Participation

1st edition of the SED school *January 2024 at Nancy, France*

Attended the 1st SED Winter School, focused on foundational and timed models for discrete event systems, including automata, Petri nets, (max,+) algebra, and their applications in control, diagnosis, and verification.

19ème Journées d'Étude en Statistique (JES) *November 2021 at Fréjus, France*

Participated in the 19th SFdS JES on missing data, focusing on theoretical and practical approaches to imputation, censoring, and model-based handling of incomplete datasets.

Summer School ETR2021 *September 2021 at Poitier, France*

Attended the Real-Time Systems Summer School, a week-long training on the design and analysis of real-time and embedded systems, covering scheduling theory, real-time operating systems, formal verification, cyber-physical systems, and timing constraints.