Aline Marguet

Researcher

aline.marguet@inria.fr
alinemarguet.fr

Research interests : branching processes, structured populations, growth-fragmentation equations, statistical inference for tree-structured data, inheritance, noise in gene expression, bacterial communities.

Employment status

Since 2019 **Researcher**, *project-team MICROCOSME, Inria Grenoble – Rhône-Alpes*, Montbonnot

2018–2019 **Postdoctoral student**, *team IBIS, Inria Grenoble – Rhône-Alpes*, Montbonnot

Mixed-effects modelling and identification of the growth and the gene expression dynamics of bacterial population from single-cell measurements.

2014–2017 **PhD student**, *CMAP, École Polytechnique*, Palaiseau

”Branching processes for structured populations and estimators for cell division” under the supervision of Vincent Bansaye and Marc Hoffmann.

Training

2017 **Doctorat de l’Université Paris-Saclay**, *École Polytechnique*, Palaiseau

2013–2014 **Master 2 Mathématiques pour les sciences du vivant**, *Université Paris Saclay*

2013 **Reçue à l’agrégation de Mathématiques**

2011–2012 **Master 1 de Mathématiques**, *ENS Rennes - Université de Rennes 1*

2010–2011 **Licence de Mathématiques**, *ENS Rennes - Université de Rennes 1*

2010–2014 **Magistère de Mathématiques**, *ENS Rennes - Université de Rennes 1*

2008–2010 **Classes préparatoires MPSI/MP**, *Lycée Kléber*, Strasbourg

2008 **Baccalauréat série S**, *Lycée Marguerite Yourcenar*, Erstein (67)

Publications

— A. Marguet, C. Smadi, Parasite infection in a cell population : role of the partitioning kernel, submitted, arXiv :2305.06962, 2023.

— A. Marguet, C. Smadi, Spread of parasites affecting death and division rates in a cell population , submitted, arXiv :2211.08265, 2022.

— V. Bansaye, B. Cloez, P. Gabriel, A. Marguet, A non-conservative Harris ergodic theorem, *Journal of the London Mathematical Society*, 106, 2459-2510, 2022.

— A. Marguet, C. Smadi, Long time behaviour of continuous-state nonlinear branching processes with catastrophes, *Electronic Journal of Probability, 26*, no. 95, 1-32, 2021.

— A. Marguet, E. Cinquemani. Identification of stochastic gene expression models over lineage trees, *Proceedings of the 19th IFAC symposium on System Identification*, Padova, July 13-16, 2021.

— A. Marguet, M. Lavielle, E. Cinquemani, Inheritance and variability of kinetic gene expression parameters in microbial cells : Modelling and inference from lineage tree data, *Bioinformatics, 35*(14), i586–i595, 2019.

— A. Marguet, Uniform sampling in a structured branching population, *Bernoulli, 25*, 4A, 2649-2695, 2019.

— M. Hoffmann, A. Marguet, Statistical estimation in a randomly structured branching population, *Stochastic Processes and their Applications, 129*, 12, 5236-5277, 2019.

— A. Marguet, A law of large numbers for branching Markov processes by the ergodicity of ancestral lineages, *ESAIM : Probability and Statistics, 23*, 638–661, 2019.

— B. Cloez, R. Dessalles, A. Genadot, F. Malrieu, A. Marguet, R. Yvinec, Probabilistic and Piecewise Deterministic models in Biology, *ESAIM : Proceedings and Surveys, 60*, 225-245, 2017.

Student supervision

Since 2021 **Charles Medous**, *PhD student*, co-supervision with L. Coquille and C. Smadi
Analysis of bacterial communities : stochastic modelling.

Since 2020 **Emrys Reginato**, *PhD student*, co-supervision with E. Cinquemani
Development, analysis and inference of stochastic models of gene expression in cell populations

2020 **Alan Flatrès**, *M2 student*, co-supervision with E. Cinquemani
Modelling and inference from lineage tree data and stochastic gene expression dynamics

Projects

2024-2029 **ARBOREAL**, *Branching resource allocation processes for the analysis and inference of phenotypic growth variability*
ANR JCJC

2021-2024 **AnaComBa**, *Analysis of bacterial communities : stochastic modelling*
Équipe-Action PERSYVAL-lab

2020-2022 **MOSTIC**, *Stochastic modelling and inference for cell communities in interaction*
IXXI

Talks (since 10/2019)

06/2023 **Informs Applied Probability Society Conference 2023, Invited session "Stochastic models for ecology and evolution"**, Nancy

05/2023 **Cérémonie de remise des prix des Olympiades de Mathématiques 2023**, Grenoble

03/2022 **Séminaire de Probabilités de l'ICJ et l'UMPA**, Lyon

01/2022 **Séminaire de Probabilités de l'IRMAR**, Rennes

08/2021 **Journées MAS 2021**, online

07/2021 **19th IFAC symposium on System Identification**, Padova (videoconference)

06/2021 **Séminaire de Modélisation aléatoire du vivant**, Paris (videoconference)

02/2021 **Séminaire de Probabilités et Statistiques**, Montpellier (videoconference)

08/2020 **Bernoulli-IMS One World Symposium 2020**, Pre-recorded talk

05/2020 **Séminaire de Statistique d'AgroParisTech**, Paris (videoconference)

02/2020 **Séminaire du LMAC**, Compiègne

01/2020 **Séminaire de probabilités et statistique**, Lille

12/2019 **Séminaire de probabilité de l'Institut Fourier**, Grenoble

12/2019 **Séminaire d'unité MaIAGE**, Jouy-en-Josas

11/2019 **Growth and division in mathematics and medicine**, Londres

10/2019 **Séminaire du Master Mathématiques pour les Sciences du Vivant**, Palaiseau

10/2019 **Journée INRIA-Bio**, Lyon

Teaching

2019–2023 **Biostatistics, TP**, *M2 Biologie*, Université Grenoble Alpes, Grenoble

2015–2017 **Écologie et statistiques, TP de R**, *L2 Biologie*, Université Paris-Sud, Orsay

2014–2017 **Calculus, TD**, *L1 MPI*, Université Paris-Sud, Orsay

Administrative functions

Since 2023 Co-organizer of the *"Groupe de travail Maths-bio Rhône-Alpes-PACA"*.

Since 2023 Member of the scientific committee of *GDR branchement*.

2023 Co-organizer of the first conference of GDR branchement, Toulouse, *https://indico.math.cnrs.fr/event/9437/*.

2021 Co-organizer of Biohasard 2021, Grenoble, *https://biohasard2020.sciencesconf.org/*.

Since 2021 Representative of researchers at "Comité de centre", Inria centre at the University Grenoble Alpes.

Since 2021 Member of " Comité des études doctorales", Inria centre at the University Grenoble Alpes.

Programming languages

Julia, R, MATLAB