Paul Banse

PhD in Computer Science

177 Route de Yorye
40380 Saint Geours d'Auribat
France
+33 6 59 36 71 13
paul.banse@ens-rennes.fr

Academic career

2024-now **Postdoc**, Institute for Socioeconomics, Duisburg, and Center for Economics and Neurosciences, Bonn, Germany.
Agent based models of social decision making

2024-2025 **Postdoc**, Barfus lab, Center for developmental economics, Bonn, Germany.
Agent based models, reinforcement learning

Formation and Diplomas

2024 **Qualification for teaching in higher education**, Conseil national des Universités, Section 27 (Computer Science) and Section 61 (Computer engeneering, automatic and data science).

2020-2023 **PhD thesis**, INSA Lyon, France, supervised by Guillaume Beslon in Beagle Team.
nominated for INSA Lyon PhD thesis excellence prize

2016–2019 **Studies in Magistère Informatique et Télécomunication**, *Ens Rennes*, Rennes.

2013–2016 **Prep School in Mathematics, Physics and Computer science**, *Lycée Thiers*, Marseille.

2012–2013 **Baccalauréat Diploma in Science, option: latin and reinforced english**, *Lycée Louis Barthous*, Pau.

Continuous training

2021 **Quantitative Viral Dynamics**, ENS Ulm, France.
François Blanquart & Joshua Weitz

2020-2023 **Ethics of research, Mental health first aid, History of science, Teaching in higher education**, *Lyon*, France, Formation école doctorale.

Scientific research

Journal Articles

2025 **Molecular Biology and Evolution**, *Structural Mutations Set an Equilibrium Noncoding Genome Fraction*.
P Banse[1], J Luiselli[1], O Mazet, N Lartillot, G Beslon

2024 **Virus Evolution**, *Innovation in viruses: fitness valley crossing, neutral landscapes, or just duplications ?*.
P Banse, S F Elena, G Beslon

2023 **Molecular Ecology**, *Forward-in-time simulation of chromosomal rearrangements: The invisible backbone that sustains long-term adaptation*.
Paul Banse[1], Juliette Luiselli[1], David P. Parsons,Théotime Grohens, Marco Foley, Leonardo Trujillo,Jonathan Rouzaud-Cornabas, Carole Knibbe, Guillaume Beslon

2022 **PLOS Computationnal Biology**, *Getting higher on rugged fitness landscapes*.
L Trujillo, **P Banse**, G Beslon

[1]co-first authors

Conference Articles

2021 **Alife**, *Simulating short- and long-term evolutionary dynamics on rugged landscapes*.
L Trujillo, **P Banse**, G Beslon

In preparation

2025 **PNAS**, *Towards a general model of Proxy failure*.
P Banse, P Verzelli, W Barfus, O Braganza

Talks

2023 **SMBE**, *Spontaneous regulation of non-coding sequences in bacteria through border effect duplications neutral bias*.
M Foley, J Luiselli, **P Banse**, J Rouzaud-Cornabas, G Beslon

2023 **NVTB**, *Spontaneous regulation of non-coding sequences through border effect duplications neutrality bias*.
L G Beslon, **P Banse**, J Luiselli

2023 **NVTB**, *Modeling the interplay between structural variations and substitutions generates saltational evolutionary dynamics.*.
P Banse, G Beslon

2023 **Alphy AIEM**, *Adaptive walks don't do walks on hypercubes*.
L Trujillo, **P Banse**, G Beslon

2021 **CCS**, *Evolutionary escape from local fitness peaks through inversion mutations*.
L Trujillo, **P Banse**, G Beslon

Posters

2023 **SMBE Ferrara**, *Modeling the interplay between structural variations and substitutions generates saltational evolutionary dynamics*.
P Banse, L Trujillo, G Beslon

2022 **ECMTB Heidelberg**, *Towards a theory of adaptive chromosomal inversions*.
P Banse, L Trujillo, G Beslon

2021 **EvoLyon 2021**, *The Danaides genomes*.
M.Foley, **P Banse**, V Lezaud, J Rouzaud-Cornabas, G Beslon

2021 **MCEB 2021**, *The Danaides genomes*.
M.Foley, **P Banse**, V Lezaud, J Rouzaud-Cornabas, G Beslon

2021 **EMBL Predicting Evolution**, *Leveraging Evolvability to Predict Molecular Evolution*.
P Banse, T Grohens, G Beslon

Experience

Research Internships

2020 **Computational Biology**, I2SysBio Valencia, Spain.
21 weeks, supervised by Santiago Elena in Evolutionary Systems Virology Laboratory

2019-2020 **Computational Biology**, INRIA Lyon, France.
24 weeks, supervised by Guillaume Beslon in Beagle Team

2019 **Artificial Evolution**, INRIA Lyon, France.
21 weeks, supervised by Guillaume Beslon in Beagle Team

2018 **Machine Learning**, *University of Alberta*, Canada.
10 weeks, supervised by Ryan Hayward in Hex research group

2017 **Crowd Simulation**, INRIA Rennes, France.
7 weeks, supervised by Julien Pettré in LAGADIC team

Organizational participation

2022-2023 **Member of gender equality commitee**, *Lyon*, France.
LIRIS

2022-2023 **Staff representative in Inria research center**, *INRIA Lyon*, France.
Comité de Centre

2022 **Organisation staff member**, *INSA Lyon*, France.
Journée de l'ED Infomaths

2021 **Organisation staff member**, *INSA Lyon*, France.
GDR BIM

2021 **Organisation staff member**, *ENS Lyon*, France.
EvoLyon

2019 **Organisation staff member**, *INSA la Rotonde, Lyon*, France.
EvoLyon

2019 **Organisation staff member**, *Manufacture des tabacs, Lyon*, France.
Mathematical Models in Ecology and Evolution

Teaching and supervising

2023 **Internship supervising: Félicie Chaudron**, *Inria Lyon*, France.
3IF

2022 **Internship supervising: Yanis Sindt-baret**, *Inria Lyon*, France.
3BS

2022-2023 **Project tutelage in Machine Learning**, *INSA Lyon*, France.
4BS

2022-2023 **Introduction to programming**, *INSA Lyon*, France.
3BS

2021 **Architecture of circuits**, *INSA Lyon*, France.
3IF

2021-2023 **Reproducibility in Research**, *INSA Lyon*, France.
5BIM

2021-2023 **Session of information about PhD**, *INSA Lyon*, France.
4-5BIM & 5IF

2021-2023 **Project tutelage in Machine Learning**, *INSA Lyon*, France.
5BIM

2021 **Internship tutelage**, *INSA Lyon*, France.
5BIM

2020 **Introduction to critical thinking & logical reasonning**, *Collège d'Arsacq*, France.
6ème-5ème

Languages

French Native
English C1 Level
Spanish B1 Level

Computer Science

Languages

Advanced: python,CamL,LaTeX

Good:	R, Isabel HOL, C ,C++, Java, Scala	
Platforms	Git Lab	Git Hub
	Overleaf	EasyChair

Computer science fields and interests

Machine Learning: RandomForest, Neural Networks, Boosting
Game theory: Basic games, auctions, routings
Distributed Algorithmic: graphs, consensus
Algorithmic: graphs, automatas, Tree, sorts
Statistics: GLM, Anova, PCA, Bootstrap
Theory of complexity: P, NP, NL, PSPACE, EXPTIME
Graph theory: scale free, small worlds, random graphs
Information theory: entropy, channels, codes

Miscellaneous

Volunteer work

2019 **Collaborative cultural work about Leonardo Da Vinci**, *Université de Lyon*, Festival des Lumières.
2023 **Research Outreach activities**, *Maison des Maths et de l'Informatique*, Journées WECCAM.
2014–2023 **volunteer work in cultural festivals**.
2016–2019 **Computer science unplugged activities**.

Interests

Hobbies Board games, role playing games, video games and acting
Family Biology, teaching, beekeeping