Joseph Penlap, PhD

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Education

Oct 2022 – Feb 2026 — **Ph.D., Automation, Signal and Image Processing**, University of Côte d'Azur, France.
- Thesis title: *Ecophysiological modelling of plant–nematode interactions: Understanding the origins and consequences of differential plant susceptibility.*
- Advisors: Frédéric Grognard, Valentina Baldazzi, Suzanne Touzeau.
- Affiliated with Inria and INRAe research centers.

July 2021 – June 2022 — **M.Sc. Mathematical Sciences, Data Science**, African Institute for Mathematical Sciences (AIMS), Cameroon.
- Thesis title: *Modelling the dynamics of a forest environment: role of water cycle.*
- Advisor: Nathalie Verdière.

Oct 2019 – July 2021 — **M.Sc. Mathematics, Analysis**, University of Dschang, Cameroon.
- Thesis title: *Spaces of locally uniformly bounded functions and applications.*
- Advisor: Jean Louis Woukeng

Oct 2016 – July 2019 — **B.Sc. Mathematics and computer science**, University of Dschang, Cameroon.

Employment History

Sept 2025 – Aug 2026 — **Temporary Teaching and Research Assistant (ATER),** Polytech Nice Sophia, France.
- teaching mathematics and computer science courses,
- supervising student projects (10+ students).

Oct 2022 – Sept 2025 — **Doctoral Researcher,** in teams: Inria (**Macbes** unit) & INRAE (ISA/**M2P2** unit), France.
- developing mechanistic mathematical models,
- conducting fieldwork and laboratory experiments,
- collection and analysis of crop data,
- writing scientific reports and journal articles.

Jan 2022 – Dec 2024 — **Assistant Faculty,** Department of Mathematics, University of Côte d'Azur, France.
- acting as teaching assistant,
- evaluating students' final projects.

Apr 2019 – July 2021 — **Research Intern,** Mathematics Research Unit (URMA), University of Dschang, Cameroon.

Publications & Preprints

1. **Penlap Tamagoua, J.**, Baldazzi, V., Grognard, F., and Touzeau, S., "Plant tolerance is explained by resource-based plant–nematode interactions," *Mathematical Biosciences*, 2025 (In revision) (hal-05394092).

2. **Penlap Tamagoua, J.**, Touzeau, S., Grognard, F., and Baldazzi, V., "Unveiling plant tolerance mechanisms through a unified plant–nematode model," *PLOS Computational Biology*, 2025 (Working paper).

Teaching Experience

Lecturer — **Polytech Nice Sophia**, France.
- Linear Algebra, 60 hours, semester2 - Winter 2025 to Spring 2026.
- Supervision of projects, 30 hours, semester2 - Winter 2025 to Spring 2026.
- Data Valorization, 46 hours, semester2 - Winter 2026.
- Fundamentals in Analysis I & II, 60 hours, semester 1 - Fall to winter 2025.

Teaching Assistant — **University of Côte d'Azur**, France.
- Mathematical Analysis, 56 hours, semester2 - Fall 2023, 2024.
- Linear Algebra, 32 hours, semester 1 - Spring 2023.

Instructor — **University of Dschang**, Cameroon.
- Introduction to Statistics, 15 hours, semester 1 - Spring 2021

Selected Talks & Posters

2025 — **Coupling plant physiology and pest demography to understand plant-pest interactions**
[***Talk***] "From Data to Models", Sophia Antipolis, France.
[***Talk***] IPN LabMeeting, Sophia Antipolis, France.

2024 — **Coupling plant physiology and pest demography to understand plant-pest interactions**
[***Talk***] 13^{th} European Conference on Mathematical and Theoretical Biology (ECMTB), Toledo, Spain.

2023 — **Modeling plant-nematode interactions to understand plant tolerance**
[***Talk***] Plant Pathology Department | Global Food Systems Institute, University of Florida, United States.
[***Talk***] *MacBiosCore* seminar, Porquerolles Island, France.
[***Talk***] Mathematical Population Dynamics, Ecology and Evolution (*MPDEE*), Marseille, France.
[***Poster***] 14^{th} Dynamical Systems Applied to Biology and Natural Sciences (*DSABNS*), Bilbao, Spain.

2022 — **Some results in Agro-forestry**.
[***Talk***] *Biocore* seminar on Automatic Control and Dynamical Dystems Theory in Artificial Ecosystems, Porquerolles Island, France.

Epistatic interactions between sickle-cell disease and alpha-thalassemia.
[***Talk***] African Institute for Mathematical Sciences (AIMS), Limbe, Cameroon.

Skills

Languages — French (native) and English (professional).
Coding — Python, R, LaTeX, Shell, Git, GitLab CI/CD, Streamlit, Gradio.
Data & Modelling — Data analysis, Optimisation, Sensitivity analysis.
Operating system — Linux, Cloud computing, High-performance computing (HPC).
Qualities — Teamwork, problem solver, leadership.

Miscellaneous Experience

Awards and Grants

2022 – 2025 — **INRAE-Inria PhD Fellowship**, Inria centre at University of Côte d'Azur.
2023 — **INRAE-Inria Travel Grant**, To attend local and international conferences.

Miscellaneous Experience (continued)

2021 – 2022 **MasterCard Foundation Scholarship for studies at AIMS**, MSc Scholarship at the African Institute for Mathematical Sciences (AIMS).

2018 – 2021 **President Paul Biya's academic excellence prize**, Yearly granted by the President of the republic of Cameroon to the best students.

2020 **National winner prize OUC Africa**, CAMES.

Certification

2023 **TOEFL**, Awarded by British Council IELTS.

2022 **Test de Connaissance du Français (TCF)**. Awarded by France Éducation International.

Volunteering

2023 – present **Scientific mediation addressed to high school students**, Inria centre at University of Côte d'Azur, France.
How to use mathematics for solving real problems in Agriculture?

2022 – present **Member of Digital Systems for Humans (DS4H) as a doctoral student**, Inria centre at University of Côte d'Azur, France.

2021 – 2022 **Designing motivational scientific quotes as part of giveback activities to society**, AIMS-Cameroon, Cameroon.