

Boyam Fabrice Yaméogo, Ph.D.

Assistant Professor of Modeling and Simulation

Applied Mathematics | Statistics | Computational Social Science | Digital Demography
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PROFESSIONAL SUMMARY

Applied mathematician and statistician (Ph.D., Université de Nantes, 2021) with 8 years of research experience and 5 years of university teaching. Specialist in synthetic population generation, microsimulation, spatial modeling and machine learning, with peer-reviewed articles in leading international journals. Uniquely combines advanced mathematical training with graduate degrees in population sciences and development economics, turning complex and non-conventional data into actionable evidence for policy in West Africa. Experienced statistical expert on programs funded by the European Union and UN-Habitat, trainer in computational social science, and Steering Committee member of the IUSSP Panel on Digital Demography, AI, and Open Science (2027–2030).

RESEARCH INTERESTS

Digital and computational demography; synthetic populations and microsimulation; spatial modeling and small-area estimation; non-conventional data (web scraping, APIs, digital traces); reproductive health and violence against women; multidimensional poverty, conflict and household living conditions; data visualization; open science and reproducible research.

PROFESSIONAL EXPERIENCE

Assistant Professor of Modeling and Simulation

2025 – Present

Université Lédéa Bernard Ouédraogo (ULBO) | Ouahigouya, Burkina Faso

- Teach probability, statistics, econometrics and data science across two departments (Mathematics & Computer Science; Economics & Management).
- Designed hands-on courses in R and Python that apply linear regression, PCA and survival analysis to real socio-economic data.
- Promoted to Assistant Professor in 2025, after serving as Lecturer in Mathematics and Statistics (Dec 2022 – 2024).

Adjunct Lecturer in Statistics

Dec 2021 – Present

Higher Institute of Population Sciences (ISSP), Université Joseph Ki-Zerbo | Ouagadougou, Burkina Faso

- Teach quantitative methods, econometrics and data science in the Department of Statistics.
- Supervise Master's theses in demography and statistics, including machine-learning forecasting of household food security and maternal union type and child stunting.

Trainer, Summer Institute in Computational Social Science (SICSS)

Aug 2026

ISSP – Université du Québec à Montréal (UQAM) | Ouagadougou, Burkina Faso

- Co-delivered the training program of a 10-day institute for postdoctoral researchers, faculty and data professionals: data visualization, automated web data collection, digital data processing and machine learning.

Lead Trainer, Workshop on Non-Conventional Data in Demography and Health

Apr 2026

Ouagadougou Population Observatory | Ouagadougou, Burkina Faso

- Delivered a 3-day workshop training staff of Burkina Faso's population observatories to extract social-media data through APIs and to scrape the web with R and Python.

Academic Supervisor, Master in Applied Mathematics and Social Sciences

Jan 2026 – Apr 2026

Aix-Marseille Université | Marseille, France

- Supervised Master's students on applied quantitative research projects.

Associate Statistical Expert

Oct 2024 – Mar 2025

Project "Conflict and Multidimensional Household Poverty in Burkina Faso", ISSP | Ouagadougou, Burkina Faso

- Built a geo-referenced conflict database from ACLED event data.

- Constructed multidimensional poverty indices across 3 national survey waves (EHCVM 2014, 2018 and 2021).
- Led the statistical and econometric analyses linking conflict exposure to household poverty.

Statistical Expert, Centre of Excellence on Housing (CEH)

May 2023 – Jun 2024

ESEA (Senegal), ISSP and UN-Habitat | Ouagadougou, Burkina Faso

- Designed the methodology and data-collection tools for indicators on access to basic social services in the WAEMU region.
- Coordinated data collection, computed the indicators and published them on the CEH platform; authored the operational notes.
- Estimated housing and land price indices using a hedonic pricing model.

Deputy Program Coordinator

Feb 2022 – Feb 2023

Population Knowledge Capacity-Building Program, ISSP, co-funded by the European Union Delegation to Burkina Faso | Ouagadougou, Burkina Faso

- Coordinated implementation, monitoring and reporting of program activities; authored technical and scientific reports.
- Co-drafted research proposals and supported capacity-building in data analysis.

Doctoral Researcher

Nov 2018 – Dec 2021

Université Gustave Eiffel – SNCF Research & Innovation partnership | Nantes, France

- Developed a decision tree to guide the choice among synthetic population generation methods, based on a systematic review.
- Generated a two-layer synthetic population (individuals within households) from French census data, benchmarking 4 reconstruction algorithms.
- Designed an integer quadratic programming method to allocate synthetic populations at a finer spatial scale, and a method to enrich them from aggregate data.
- Published 4 papers from this work and contributed to the open-source Python package bhepop2.

EDUCATION

Ph.D. in Mathematics (Mathematics and their Interactions)

2021

Université de Nantes, France

- Thesis: *Calibration methodology for a multimodal travel model to assess environmental externalities using open data: the case of the Nantes urban area*, defended December 15, 2021 (theses.fr/2021NANT4085).
- Industry-funded doctorate in partnership with SNCF Research & Innovation and Université Gustave Eiffel.

M.Sc. in Mathematics and Applications – Applied Mathematics and Social Sciences

2018

Aix-Marseille Université, France

Research Master in Population Sciences

2017

Higher Institute of Population Sciences (ISSP), Université Joseph Ki-Zerbo, Burkina Faso

Maîtrise (4-year degree) in Macroeconomics and Development Management

2015

Université Saint Thomas d'Aquin, Burkina Faso

RESEARCH AND PUBLICATIONS

Peer-Reviewed Journal Articles

1. Gastineau, P., Can, A., **Yaméogo, B. F.**, Luquezi, L. G., Hankach, P., Vandanjon, P.-O., & Bescond, V. L. (2024). Modeling exposure to mobility-related pollution: Review and key challenges. *Transportation Research Record*, 2678(7), 587–603. doi:[10.1177/03611981231208907](https://doi.org/10.1177/03611981231208907)
2. **Yaméogo, B. F.**, Hankach, P., Vandanjon, P.-O., & Gastineau, P. (2023). Allocating synthetic population to a finer spatial scale: An integer quadratic programming formulation. *Environment and Planning B: Urban Analytics and City Science*, 50(2), 515–540. doi:[10.1177/23998083221120019](https://doi.org/10.1177/23998083221120019)
3. **Yaméogo, B. F.**, Vandanjon, P.-O., Gastineau, P., & Hankach, P. (2021). Generating a two-layered synthetic population for French municipalities: Results and evaluation of four synthetic reconstruction methods. *Journal of Artificial Societies and Social Simulation*, 24(2), 5. jasss.org/24/2/5.html

4. **Yaméogo, B. F.**, Gastineau, P., Hankach, P., & Vandanjon, P.-O. (2021). Comparing methods for generating a two-layered synthetic population. *Transportation Research Record*, 2675(1), 136–147.
[doi:10.1177/0361198120964734](https://doi.org/10.1177/0361198120964734)

Working Paper

- **Yaméogo, B. F.**, Vandanjon, P.-O., Hankach, P., & Gastineau, P. (2021). Methodology for adding a variable to a synthetic population from aggregate data: Example of the income variable. HAL preprint [hal-03282111](https://hal.archives-ouvertes.fr/hal-03282111).

Software

- Contributor to *bhepop2* (Bayesian Heuristic to Enrich POPulation by EntroPy Optimization), open-source Python package. github.com/tellae/bhepop2

Selected Conference Presentations

- **Yaméogo, B. F.** (2024). Spatialising agents with a quadratic programming algorithm. Workshop on Complex Systems Modelling (2nd ed.), “Modelling as a tool to assess and design resilience strategies”, April 25–27, 2024.
- **Yaméogo, B. F.**, Gastineau, P., Hankach, P., & Vandanjon, P.-O. (2021). Assessing synthetic population generation algorithms on French census data. 3rd Francophone Transport and Mobility Meetings (RFTM), online, June 2–4, 2021.
- Golaz, V., & **Yaméogo, F.** (2018). Linking individual and contextual data through multilevel methods: New possibilities, persistent pitfalls. INED Applied Statistics Meetings, Paris, May 31, 2018.

SKILLS AND TECHNICAL COMPETENCIES

- **Statistical Modeling:** econometrics (qualitative variables, panel data, time series), survival analysis, multilevel models, multivariate analysis, hedonic pricing models, multidimensional poverty measurement.
- **Data Science and AI:** machine learning, data mining, text mining, web scraping, social-media APIs, data visualization and dashboards.
- **Modeling and Simulation:** synthetic population generation, microsimulation, spatial allocation and spatial modeling, integer quadratic programming.
- **Research Methods:** survey design and sampling, indicator design, monitoring and evaluation, policy briefs.
- **Programming and Tools:** R, Python, SAS, Stata, LaTeX, Markdown, Git/GitHub.
- **Languages:** French (native); English (professional proficiency: C1 reading and writing, B2 speaking).

GRANTS, AWARDS AND AFFILIATIONS

- Steering Committee Member, IUSSP Scientific Panel on Digital Demography, AI, and Open Science (2027–2030).
- Full Member, International Union for the Scientific Study of Population (IUSSP), since 2026.
- Associate Researcher, Laboratory of Numerical Analysis, Computer Science and Biomathematics (LANIBIO), Université Joseph Ki-Zerbo, Burkina Faso.
- Associate Researcher, Population–Environment–Development Laboratory (LPED), Aix-Marseille Université, France.
- Industry-funded doctoral position, Université Gustave Eiffel – SNCF Research & Innovation (2018–2021).

PROFESSIONAL DEVELOPMENT

- **Summer School in Computational Data Analysis**, Institut Polytechnique de Paris, France (Jun – Jul 2025)
- **Summer School on Joint Models for Longitudinal and Time-to-Event Data**, ISPED, Université de Bordeaux, France (Jun 2025)
- **Monitoring and Evaluation**, Université Joseph Ki-Zerbo, Burkina Faso (Oct 2022)
- **Writing Policy Briefs**, Université Joseph Ki-Zerbo, Burkina Faso (May 2022)
- **eX Modelo Summer School on Exploring Simulation Models**, Complex Systems Institute, Paris, France (Jun 2019)
- **Oral and Scientific Communication**, SNCF Research & Innovation, France (Feb – Mar 2019)