

## **Professor Romain GLELE KAKAI**

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### **I. Education**

- Full Professor in Biomathematics (2015 – till now), University of Abomey-Calavi
- Associate Professor in Biomathematics (2011-2015), University of Abomey-Calavi
- Senior lecturer in Biomathematics, (2009-2011), University of Abomey-Calavi
- Lecturer (2007-2009) in Biomathematics, University of Abomey-Calavi
- Doctor in Biomathematics (The Highest distinction with Congratulations), Gembloux Agricultural University, Belgium, 2005
- MSc in Applied statistics (Ranked First), Gembloux Agricultural University, Belgium, 2001
- Engineer Degree in Agronomy, Major: Forestry (Ranked First), Faculty of Agronomic Sciences, University of Abomey-Calavi, 2000.
- Bachelor Degree in Agronomy (Ranked First), Faculty of Agronomic Sciences, University of Abomey-Calavi, 1998.

### **II. Prizes and International Distinctions**

- Prize “Heinz and Johannes”. Best research paper in Ecology; 2007 edition. The Support Africa International Foundation, Germany, 2007.
- Prize “Jan Tinbergen”. Best young statistician from emerging and developing countries. The International Statistical Institute (ISI), Australia, 2005.
- Prize “Biométrie 88”. Best young French biometrician in Belgium. National Association of French Belgian biometricians, Belgium, 2002.
- Fellow of the Alexander von Humboldt Foundation for outstanding achievements in research. Germany, 2007.
- Member of the selection committee of the International Climate Protection Fellowship Programme of the Alexander von Humboldt Foundation (Germany), since 2017
- President of AGNES (African-German Network of Excellence in Science), since 2019.
- Member of the World Economic Forum community (Young scientists). Participation in the Annual meeting of the new champions 2012, Tianjin, China.

### **III. Recent publications in AI and Machine learning**

1. Hounmenou, C. G., Gneyou, K. E., & **Glélé Kakai, R.** (2020). An Extension of the Quadratic Error Function for Learning Imprecise Data in Multivariate Nonlinear Regression. *Journal of Probability and Statistics*. DOI.10.1155/2020/9187503.
2. Hounmenou, C. G., Gneyou, K. E., & **Glélé Kakai, R.** (2020). An Extension of the Quadratic Error Function for Learning Imprecise Data in Multivariate Nonlinear Regression. *Journal of Probability and Statistics*. DOI.10.1155/2020/9187503
3. Hounmenou, C. G., Gneyou, K. E., & **Glélé Kakai, R.** (2021). A Formalism of the General Mathematical Expression of Multilayer Perceptron Neural Networks. *Preprint*. DOI: 10.20944/preprints202105.0412.v1.
4. Hounmenou, C. G., Behingan B.M., Gneyou, K. E., Chrysostome, C. & **Glélé Kakai, R.** (2021). Robustness of Imputation Methods with Backpropagation Algorithm in Nonlinear Multiple Regression. *Preprint*. DOI: 10.20944/preprints202105.0390.v1.

#### **IV. Publications in 2021**

1. Tovissodé, C. F., Diop, A., & **Glèlè Kakai, R.** (2021). Inference in skew generalized t-link models for clustered binary outcome via a parameter-expanded EM algorithm. *Plos one*, 16(4), e0249604.
2. Tovissodé C.F., Doumatè J.T., **Glèlè Kakai R.** (2021). A Hybrid Modeling Technique of Epidemic Outbreaks with Application to COVID-19 Dynamics in West Africa. *Biology*, 10, 365. <https://doi.org/10.3390/biology10050365>.
3. Mangamana E. T., **Glèlè Kakai R.**, Qannari E. M. (2021). A general strategy for setting up supervised methods of multiblock data analysis. *Chemometrics and Intelligent Laboratory Systems* 217(2): 104388. DOI: [10.1016/j.chemolab.2021.104388](https://doi.org/10.1016/j.chemolab.2021.104388)
4. Gnanvi J., Salako V. K., Kotanmi B., **Glèlè Kakai R.** (2021). On the reliability of predictions on Covid-19 dynamics: a systematic and critical review of modelling techniques. *Infectious disease modeling*, 6: 258-272.
5. Tovissodé, C.F., Honfo, S.H. and Doumatè, J.T., **Glèlè Kakai, R.** (2021). On the Discretization of Continuous Probability Distributions Using a Probabilistic Rounding Mechanism. *Mathematics*, 555 (9). <https://doi.org/10.3390/math9050555>

#### **V. PhD Students under supervision in AI**

1. Ariane Houetohossou (2021-2023). Architectural and parametric optimization of pre-trained Deep Convolutional Neural Network (DCNN): Stress detection on tomato plants under climate and infection based simulated environments.
2. Peace Souand Tahi (2021-2023). Artificial Intelligence based problem-solving in agricultural yield prediction: Optimization of Ensemble Learning techniques performances and ability of base regressors in the prediction of yield of maize cultures under several controlled weather and fertilization patterns.
3. Arsène Mushagalusa Ciza (2021-2023). Random forest regression for count response data and diseases vectors abundance prediction: application to ticks (*Rhipicephalus appendiculatus*) abundance in grazed permanent pastures.

#### **VI. Visiting Professor of applied statistics**

1. Kwame Nkrumah University of Science and Technology (KNUST), GHANA. 2015- .
2. Wascal's GRP-Climate Change and Biodiversity, University Félix Houphouët Boigny (COTE D'IVOIRE). 2014 -
3. University of Abdou Moumouni; Faculty of Sciences, NIGER. 2010-2017.
4. University of Lome; Faculty of Sciences, TOGO. 2018 -
5. University of Kara; Faculty of Sciences, TOGO. 2010-

#### **VII. Collaborative research projects**

1. DELTAS Africa II. Sub-Saharan Africa Consortium for Advanced Biostatistics training. African Union. (2021-2025). *Coordinator in Benin*
2. HRH-SEMCA. Socio-ecological modelling of COVID-19 in Africa. BMBF, (2021-2026). *Coordinator*
3. TEBWA. Training Epidemiologists and Biostatisticians for enhanced response to disease outbreak and epidemic in West-Africa. EDCTP, (2021-2024). EU. *Coordinator*
4. DAAD "In-Country/In-Region Scholarship Programme" for Master in Statistics (Major Biostatistics) & Doctorate in Biometrics. Deutscher Akademischer Austauschdienst German Academic Exchange Service (DAAD). (2019-2022). *Coordinator*
5. TWAS (N°20-346 RG/MATHS/AF/AC\_G – FR3240314177). Modelling nonlinear trend in multilevel data using flexible distributions: a guideline for selecting the best of parametric and semi-nonparametric approaches. (2020-2021). *Coordinator*