



4<sup>th</sup> International Conference on  
**Statistics for National Security and Socio-Economic Development**  
**PROFESSIONAL STATISTICIANS SOCIETY OF NIGERIA**

Promoting Professionalism in Statistical Research

April 20-23, 2020

**PROFESSIONAL STATISTICIANS SOCIETY OF NIGERIA (PSSN)**  
*Invitation & Call for Papers*  
 to the

**4<sup>th</sup> International Conference**

**THEME:**  
**STATISTICS IN NATIONAL SECURITY AND INDUSTRIAL REVOLUTION**

**SUB-THEMES:**

- Statistical Theories and Methods for Enhancing Social and Health Security.
- Statistical Modelling of Impacts of Industrial Revolution in Sustainable Development Goals (SDGs)
- Statistics for Industrial Revolution and Food Security.
- Big Data Analytics for National Security

**VENUE:** Main Auditorium, University of Ilorin, Ilorin, Nigeria.  
**DATE:** 20th - 23rd April, 2020

**PRE-CONFERENCE WORKSHOP**  
**THEME:** Spatio-Geoaddivitive Regression Modelling: Methods and Applications Using R and Bayes-X Software  
**DATE:** 20th April, 2020 **VENUE:** Al-Hikmah University, Adeta, Ilorin, Nigeria

**KEYNOTE ADDRESS SPEAKERS:**

**CHIEF ASIWAJU BOLA AHMED TINUBU**  
 The Jagaban of Borgu & Former Executive Governor of Lagos State, Nigeria.

**ALHAJI ALIKO DANGOTE, GCN**  
 Chariman & CEO Dangote Group Corporate Head Office, Union Marble House, Falomo, Ikoyi, Lagos, Nigeria

**ALHAJI CHIEF KAMAR ABIOYE**  
 CEO/Managing Director, KAM Industries Nig. LTD. No.1, New Yidi Road, Ilorin, Kwara State

**LEAD PAPERS PRESENTERS:**

**PROFESSOR BAYO H. LAWAL**  
 Department of Statistics and Mathematical Sciences, Kwara State University, Malete, Kwara State, Nigeria.

**PROFESSOR DAUD K. SANGODOYIN**  
 Oyo State Commissioner for Education, Science & Technology, Oyo State, Nigeria.

**DR. OYELOLA A. ADEGBOYE**  
 Australian Institute of Tropical Health & Medicine, James Cook University, Australia.  
**TOPIC: LET THE DATA TALK: VISUALIZING GLOBAL HEALTH BURDEN**

**DR. ABDULLATEEF BELLO**, Islamic Development Bank, Jeddah, Kingdom of Saudi Arabia.

**CHIEF HOST**  
 His Excellency **MALLAM ABDULRAHMAN ABDULRAZAQ**  
 Executive Governor of Kwara State, Nigeria

**HOST**  
**PROFESSOR SULYMAN AGE ABDULKAREEM**  
 Vice-Chancellor University of Ilorin, Ilorin, Nigeria.

**ROYAL FATHER OF THE DAY**  
 His Royal Highness **ALH. (DR.) IBRAHIM ZULKARNAINI GAMBARI**  
 The Emir of Ilorin & Chairman, Kwara State Traditional Council

**CALL FOR PAPERS**

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**PROFESSIONAL STATISTICIANS SOCIETY OF NIGERIA (PSSN) 1<sup>st</sup> VIRTUAL CONFERENCE**  
**Monday 24<sup>th</sup> – Wednesday 26<sup>th</sup> August 2020**  
**TABLE OF ABSTRACTS / SCHEDULE FOR PRESENTATIONS**

Time	ITEM		
<b>Day 1: Monday, 24 August, 2020</b>			
10.00 – 10.20	<b>Meet and Greet on Zoom by Participants</b>		
10.20 – 11.00	<b>Opening Speech and Keynote Address I by Professor Sulyman Age AbdulKareem Vice-Chancellor, University of Ilorin, Nigeria</b>		
11.00 – 12.00	<b>LEAD PAPER PRESENTATION I BY Professor Bayo H. Lawal Department of Statistics and Mathematical Sciences, Kwara State University, Malete</b>		
12.00 – 12.10	<b>Break-up into Parallel Sessions (Zoom Rooms)</b>		
	<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>
<b>Chairman</b>	<b>Prof. W. B. Yahya</b>	<b>Dr. S. O. Oyamakin</b>	<b>Dr. M. K. Garba</b>
12.10 – 15.00	<b>A1</b> A Sufficient Dimension Reduction Selection of Core Relevant Predictive Variables and Classification of University Students' Academic Class of Degrees <i>Oloredo, K. O. and Babalola, M.</i>	<b>B1</b> ARIMA Model Selection for Count Data with Outliers <i>Akeyede, I., Saleh, I. M., Bello, A. J. and Abubakar, M. B.</i>	<b>C1</b> On the Quasi-Transmuted Mukherjee-Islam Distribution <i>Osowole, O. I., Izunobi, C. H. and Nwaka, R.</i>



<b>A20</b> Econometric Analysis of the Effects of Some Major Foreign Currencies on Nigeria Naira using Toda-Yamamoto Techniques <i>Garba, M. K., Akanni, S. B., Yahya, W. B. and Banjoko, A. W.</i>	<b>B20</b> A Method of Profiling a Heterogeneous Mixed Population's Dynamics: A Statistical and Informatics Framework <i>Bello, A.O., Yaun Chang li and Oguntolu, F. A.</i>	<b>C20</b> A Model of the Mean-Variance (Risk and Expected Return in Investment) <i>Imande, I. I., Mohammed, A. G., Abubakar, M. and Aondoakaa, J.</i>
<b>A21</b> Barinaadaa-Didi(B-D) Distribution: Statistical Properties and Applications <i>B. J. Nwikpe and I. Didi Essi</i>	<b>B21</b> A Mixture Model Approach for the Analysis of Zero-Inflated Data <i>Isa, A. M.</i>	<b>C21</b> Application of Linear Programming Techniques for Profit Maximization (A Case Study of Jejelaiye Bakery Firm, Igbo-Ora, Oyo State, Nigeria) <i>Fatoki, O., Hassan, F. A. and Ilo, H. O.</i>
<b>A22</b> Evolution of Population Growth Models and their Predictive Potentials in Population Projection <i>Oyamakin, S. O. and Wale-Orojo, O.</i>	<b>B22</b> Applications of Two Non-Central Hypergeometric Distributions of Biased Sampling Statistical Models <i>Adetunji, K. O., Alanamu, T., Adefila, E. J. and Muhammed, K. A.</i>	<b>C22</b> An Analysis of Latest CD4 Counts of HIV Infected Patients Using Logistic Regression Approach <i>Arum, K. C., Alokam, D. O., Oranye, H. E. and Ugah, T. E.</i>
<b>A23</b> On Appropriate Threshold Model for Modeling and Forecasting Exchange Rate of Some Selected Countries <i>Akintunde, M.O., Amusan, A.S., Alabison, R.M. and Masopa, A.N.</i>	<b>B23</b> Generalized Poisson-Gamma Empirical Bayes Model for Detection of Crime Hotspots in Nigeria <i>Mbata U. A., Adeleke, I. A., Olalude, G. A. and Amusan, A. S.</i>	<b>C23</b> Assessment of Some Demographic Variables on Academic Needs Achievement Among Undergraduate Students of Two Nigerian Universities: Implications for Sociologists of Education <i><sup>1</sup>Saba, M. D. and <sup>2</sup>Adetunji, K. O.</i>



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<b>A6</b> On a Comparative Analysis of Robust Estimation Methods in Linear Regression <i>Odiar, K. A. and Ekerikevwe, K. I.</i>	<b>B6</b> Modeling Geospatial Autocorrelations of Open Defecation Indicators in Nigeria <i>Ajao, I. O., Odeyemi, C. A. and Obafemi, O. S.</i>	<b>C6</b> Compulsory Industrial Training among Undergraduates: Statistical Review of Purposes, Prospects and Problems <i>Ikegwu, E. M., Ayodeji, A. A., Etisioro, C. O. and Muhammad, I. A.</i>
<b>A7</b> The Exponentiated Half-Logistic Skew-t Distribution with Application to Inflation rates in Nigeria <i>Adubisi, O. D., Abdulkadir, A. &amp; Chiroma, H.</i>	<b>B7</b> Generalization of Rayleigh distribution' with its Properties and Application <i>Abdulsalam, H. A. and Yahaya, A.</i>	<b>C7</b> Regression Analysis of Exponentiated Gumbel Type-2 Life time Model: Bayesian Approach <i>Ogunde, A. A., Chukwu, A. U. and Ajayi, B.</i>
<b>A8</b> On Statistical Modeling the Population Distribution of Hemophilia using Gene Sequencing Data for Enhancing Social and Health Security. <i>Omokaro B. and Nwanunu P.</i>	<b>B8</b> Comparison of Classical ARIMAX and ARIMAX with Lognormal Error Model <i>Shittu, O. I. and Bello, A. O.</i>	<b>C8</b> Stochastic Modelling of Infectious Diseases in a Constant Population <i>Olawuwo J. G., Ayansola O. A. and Olajide, J. T.</i>
<b>A9</b> Influence of Social Media Accessibility on the Academic Performance of Students in Federal Polytechnic Bauchi, Nigeria <i>Nenlat, R.R., Pam, D.D., Sa'ad, M. &amp; Ahisia, J. I.</i>	<b>B9</b> Application of Time Series Analysis to Federal Budgetary Allocations for Nigerian Education Sector <i>Eze, N. M., Yahya, W. B., Asogwa, O. C., Eze, C. M and Okonkwo, C. I.</i>	<b>C9</b> Statistical Properties of Cubic Transmuted Generalized Exponentiated Distribution and Applications to Life time data <i>Eziche, O. N., Ogunde, A. A, Ajayi, B. and Omosigho, D. O.</i>
<b>A10</b> Analysis of Classification Methods Applied to Coronary Heart Disease Patients <i>Egbo, I.</i>	<b>B10</b> A Note on Exponential-Exponentiated Odd Generalized Uniform Distribution <i>Yahaya, A. and Doguwa, S. I.</i>	<b>C10</b> Box-Jenkins Modeling of Unemployment Rates in Nigeria <i>Agog, N. S., Bako, S. S., Bamanga, M. A. and Peter, M. and Yahaya, J. K.</i>

Day 2: Tuesday, 25 August, 2020

## A Method of Profiling a Heterogeneous Mixed Population's Dynamics: A Statistical and Informatics Framework

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### Abstract

This work presents how to profile the frequencies of occurrences staged at different given time or space with varying inferring factors for the population's member identification and monitoring. We created two major design of the study; one is with equal time interval components of study and for an overlapping trajectory of components. Given a Space  $S$  there are many possible trajectories of a phenomenon of studies within a given space from numerous trajectories at different states say location or time.

To uncover the dynamics of individual members, uncover lost important dynamics state/behaviors in a heterogeneous population of the phenomenon of studies becomes cumbersome considering the complication of distribution functions.

This framework is designed to handle the problem of developmental interval measurements and monitoring where distribution changes as a function of time and it is cumbersome to use models with a distribution approach to capture the dynamic of population shift effectively.

This method may be important in the real data for uncovering cell type studies in a given heterogeneous population and NGS-data with several resequencing reads trajectory study for lost reads. The method is a trajectory learning approaches-the work is to design a population-based framework for learning and uncovering dynamics of trajectory growth/increase in a heterogeneous population of any phenomenon of study. We wrote R code using default detection rates parameters in the different scenarios of the simulation study, using the open-source software JAGS via the R package 'R2jags' on CRAN.Rproject.org/package=jagsUI. The software was used to synthesis various scenarios of the population with equal interval and overlapping trajectories. The demonstrated application on how effective our method will uncover population snapshot situation effect, proliferation rate, death rate-decline/disappearances shift in population composition abundance contents (population transitions)-under close assumption, under relaxing close assumption and under the steady-state assumption of contents of composition shifts.

This statistical/informatics framework can be applied to a biological population(population of a biological cell of heterogeneous types, income dynamics of increasing population, capture and recapture problems, income, and social composition variety in populations. Triage cases and COVID-19 geographical spread trajectory within selected intervals.

**Keywords:** Profiling Method, Population's Dynamics, overlapping trajectory, close assumption, JAGS