Biography/Background

Ikpotokin Osayomore hails from Ekekhen, Igueben Local Government Area, Edo State. He works in the Department of Mathematics, Faculty of Physical Sciences, Ambrose Alli University, Ekpoma Nigeria. Currently he is a Lecturer I. Dr. Ikpotokin, Osayomore research interests span through Statistics which includes Resampling Techniques, Statistical Computing, Multivariate Control Charts Techniques, Inferential Statistics, Analysis of Variance, Sampling Theory and Survey Methods, Regression and Correlation Analysis. He has a particular interest in Bootstrapping and Permutation Methods of Resampling Techniques. He has published many peer-reviewed articles in his research area and he is a member of the Nigerian Statistical Association, Statistical Research Group, Nigerian Statistical Society. Some responsibilities held include Departmental Students Adviser (2014 – 2017), Departmental Coordinator Foundation Programmes (2010 -2012), Departmental Undergraduate Seminar Coordinator (2013 –2015), Publicity Secretary, Faculty Seminar Committee headed by Prof. I.A. Onimawo (2008 -2010), etc. Dr. Ikpotoin, Osayomore joined the services of this University on 21st December, 2006. He has worked for the University over 11 years. He likes reading, gardening and surfing the net.

Dr. Ikpotoin, Osayomore contributes to the peer – reviewed publications such as: Performance Evaluation on Bootstrap Multivariate Exponentially Weighted Moving Average (BMEWMA) Control Chart, On the Bootstrap Multivariate Exponentially Weighted Moving Average (BMEWMA) in Setting Control Limits and P-Values for Interpreting Out of Control Signals, Permutation Approach in Obtaining Control Limits and Interpretation of out of Control Signals in Multivariate Control Charts, Constructing Hotelling's T^2 Control Limits for Different α Levels of Significance, Correlation Analysis: The Bootstrap Approach, etc.

Qualifications

Doctor of Philosophy (Industrial Mathematics), University of Benin, Benin City (2017)
Master of Philosophy (Industrial Mathematics), University of Benin, Benin City (2012)
Master of Science (Statistics), University of Ilorin, Ilorin (2006)
Bachelor of Science Honours (Statistics), Ambrose Alli University, Ekpoma (2001)

Research Focus

Resamplng Techniques: The Bootstrap and Permutation Approaches.
Multivariate Control Charts Signals and its Interpretations.
Computational Methods in Statistics.

Professional Affiliation

Member, Nigerian Statistical Association
Member, Statistical Research Group
Nigerian Statistical Society

Social/community engagements

Importance of Statistics in Fostering Socio-Economic Development across the Local Government Area. A Lecture presented at Etsako Central Local Govt. Secretariat, Fugal in 2012

Publications (journals, conference proceedings etc)

1. **Ikpokotin, O.,** Ishiekwene, C.C., and Ekhosuehi, N. (2017)**.** Performance Evaluation on Bootstrap Multivariate Exponentially Weighted Moving Average (BMEWMA) Control Chart. *Journal of the Nigerian Statistical Association (JNSA), 28:59 – 73*

   ABSTRACT: A fundamental hypothesis in theoretical statistical quality control is that samples are independently and identically distributed; but this assumption is frequently violated in many production processes. Moreover, the presence of autocorrelated data in many process control applications gravely affects the performance of classical control charts if not appropriately accounted for. In this paper, bootstrap T^2 and bootstrap multivariate exponential weighted moving average (BMEWMA) control charts are proposed for monitoring and controlling multivariate autocorrelated processes. From numerical illustration, results obtained from the Average Run Length (ARL), standard deviation run length (SDRL), median run length (MRL) and percentiles run length (PRL) displayed in tabular and graphical forms, shows that the proposed bootstrap control methods performed better than the F-distribution T^2 control method.

   Keywords: run lengths, autoregressive model, bootstrap, mean vector, cross-covariance, autocorrelation.

2. **Ikpotokin, O.,** and Ishiekwene, C.C. (2017). On the Bootstrap Multivariate Exponentially Weighted Moving Average (BMEWMA) in Setting Control Limits and P-Values for Interpreting Out of Control Signals. *Canadian Journal of Pure and Applied Sciences, 11(2):4233-4243 (***CANADA***)*

   ABSTRACT

   The effects of control limits that are too narrow increase the rate of false alarms, while those that are too wide may not be able to identify special causes of variability in any given process. It is of this view that control chart methodology that can detect small to moderate shifts in the mean vector should be developed so that the probability of detecting or not detecting false alarm rate should be minimized. The bootstrap multivariate exponentially weighted moving average is proposed in setting control limits, while p-value method was introduced to identify out of control signals.

Keywords: Quality characteristics, BMEWMA control chart, out-of-control signals, control limits, p-values.

3. **Ikpotokin, O.,** and Ishiekwene, C.C. (2016). Permutation Approach in Obtaining Control Limits and Interpretation of out of Control Signals in Multivariate Control Charts. *International Journal of Statistics and Applications, 6(6):408-415 doi:10.5923/j.statistics.20160606.10*

Abstract: The use of multivariate control charts in manufacturing and service industries is often avoided because of the complexity in its development and interpretation of out of control signals. Most multivariate control charts require a specific distributional assumption to establish their control limits, but the bootstrap and permutation methods does not rely on such distributional assumption. Control limit obtain from the bootstrap method is approximate in nature while that of permutation is exact. This study introduces the permutation method in obtaining exact control limits as well as interpreting out of control signals in multivariate Hotelling's T2 control charts. A performance study of the methods using empirical data sets shows that results from the proposed Permutation method when compared with other existing methods perform better in identifying out of control signal rather than stopping the entire processes.

Keywords: Exact control limits, Hotelling's T2, out-of-control signals, Permutation p-values

4. **Ikpotokin, O.,** and Ishiekwene, C.C. (2015). On the Bootstrap Approach in Obtaining Control Limits and Interpretation of out of Control Signals for Multivariate Control Charts. *Nigerian Statistical Association (NSA)* 32nd *Annual Conference Proceedings, Osogbo, Nigeria, 424-435*

5. **Ikpotokin, O., (**2015). Markov Chain Method for Monitoring Mean Vector in Multivariate Cumulative Sum Control Chart. *Journal of the Nigerian Statistical Association (JNSA), 27: 62-73*

6. **Ikpotokin, O.,** and Ishiekwene, C.C. (2015): Performance Evaluation of Bootstrap Hotelling's T^2 Control Chart for Bivariate Data. The *Journal of Nigerian Institute of Production Engineers, 19:128-140.*

7. **Ikpotokin, O.,** and Ishiekwene, C.C. (2014). Constructing Hotelling's T^2 Control Limits for Different α Levels of Significance. *Journal of Applied Science and Technology (JAST), 19(1&2):55-64.(***GHANA***)*

Abstract: When the quality of a product is controlled by combinations of two or more variables, a high level decision quickly determines the out of control signals, while simultaneously evaluating the variable(s) responsible for the false alarm rate (α) levels of significance. In this connection, bootstrap algorithm for constructing Hotelling's T^2 control limits was developed and implemented using Visual Basic Code to resolve such problem. The results obtained using industrial production process data proved that the bootstrap control limit at different a levels of significance performed better when compared with other existing methods. Akaike Information Criterion was also applied to identify the variable(s) responsible for the out of control signals

8. **Ikpotokin, O.,** and Ishiekwene, C.C., (2014). Identifying out of Control Signals in Bivariate Control Chart via the Bootstrap Approach. *Journal of the Nigerian Association of Mathematical Physics, 26 (March):305 – 310.*

9. **Ikpotokin, O.,** and Edokpa, I.W. (2013). Correlation Analysis: The Bootstrap Approach. *International Journal of Scientific and Engineering Research (May), 4(5):1695-1702.* (**USA**)
Abstract: For a general class of problems, the bootstrap method of resampling is one of the possible methods of constructing tests of significance. The sampling distribution of a test statistic for an experiment compiled by the bootstrap approach requires no reference to the population distribution and therefore no requirement that it should conform to a mathematically definable frequency distribution. Algorithms for the bootstrap distribution of correlation coefficients are presented and implemented. As an illustrative example, a critical value for Pearson's product moment correlation coefficients and Spearman's rank correlation coefficients are produced for a given set of data.
Keywords: Bootstrap test, p-value, algorithm, paired observations, correlation.

10. **Ikpotokin, O.,** and Oyegue F.O. (2012). Estimation of P-Value: Bootstrap a Viable Alternative to Permutation Approach. *Proceedings of the 1st Biennial National Conference of Statistics Research Group, Benin City, Nigeria, 62 – 70.*

11. **Ikpotokin, O.,** Erimafa, J.T., and Edokpa, I.W. (2012). Statistical Analysis of Gender Equality in Students' Enrolment in Ambrose Alli University, Ekpoma. *Journal of the Nigerian Association of Mathematical Physics, 21 (July):455 – 460.*

12. **Ikpotokin, O.,** Ogbonmwan, S. M., and Oyegue, F.O. (2012). An Algorithm for Generating Bootstrap Distribution for a Two Sample Experiment. *The Journal of* the *Mathematical Association of Nigeria (*ABACOS).39(2): 81 – 91.

13. **Ikpotokin, O.,** Erimafa, J.T., and Edokpa, I.W. (2012). Statistical Analysis of Gender Equality in Students' Enrolment in Ambrose Alli University, Ekpoma. *Journal of the Nigerian Association of Mathematical Physics, 21 (July):455 – 460.*

14. **Ikpotokin, O.,** Ogbonmwan, S. M., and Oyegue, F.O. (2012). An Algorithm for Generating Bootstrap Distribution for a Two Sample Experiment. *The Journal of* the *Mathematical Association of Nigeria (*ABACOS).39(2): 81 – 91.

15. Akpa, M. O., and **Ikpotokin, O.** (2012). Modeling the Determinants of Fertility among Women of Childbearing Age in Nigeria: Analysis Using Generalized Linear Modeling Approach. *International Journal of Humanities and Social Science, 2 (18): 167 – 176* (**USA**)
Abstract: *Apart from proximate determinants, certain socio demographic factors have been reported to inform fertility in some developing nations but a comprehensive report for Nigeria is lacking in the literature. This study tested effects of some determinants of fertility on the level of fertility in Nigeria using data from the 2008 Nigerian Demographic Health Survey (NDHS). Data on 20,974 women were extracted from the 2008 NDHS data and analyzed using descriptive statistics and Poisson regression. Women with no education and those with secondary school education had 1.36 times risk and 17% increases in fertility*

(respectively) over those with higher education. Rural women were 1.02 times more likely to be at risk of high fertility compared to women in urban areas. Fertility level in Nigeria is higher in the rural areas than in the urban areas while level of education of women negatively impacted on their risk of having high fertility.

Keywords: Fertility rate, Generalized linear models, Poisson regression, Nigeria, Women, childbearing

16. **Ikpotokin, O.,** and Erimafa, J.T., (2011). Analysis of the Impact of Students' Enrolment on Academic Planning System of Universities: a case study of Ambrose Alli University,Ekpoma, Nigeria. *Journal of Engineering Science and Application (JESA), 7(2):58 – 65.*

17. **Ikpotokin, O.,** and Ikpotokin, I. (2010). Alternative approach for obtaining the Median and Mode of a Frequency Distribution. *The Journal of* the *Mathematical Association of Nigeria (*ABACOS).37(2): 10 – 21.

18. Edokpa, I.W, **Ikpotokin, O.,** and Erimafa, J.T. (2009). A Study of Average Run Length Distribution of an Exponentially Weighted Moving Average Control Chart using Diabetic Data from Oyo State of Nigeria from Jan. 1974 – Feb. 1986. *Journal of Mathematical Sciences, 20 (3):171- 179* (**INDIAN**)

19. Ogbeide, E.M., and **Ikpotokin, O.** (2009). Population Model of Esan West Local Government Area of Edo State, Nigeria. *Journal of Researcher, 1(3)*: 68 – 72.(**USA**)

20. **Ikpotokin, O.,** and Ozegen, K.O. (2009). Application of Real life Data in Teaching Statistics to Physical Sciences and Engineering Students. *Journal of Intellectualism, 2 (1): 170-175*

21. **Ikpotokin, O.,** Ozegen, K.O., and Isere, A.O. (2009). Generalized Linear Model Analysis of Repeated Measures Data on Birds Weight. *Journal of Engineering Science and Application (JESA),6 (1&2):10 – 17*

22. **Ikpotokin, O.,** and Erimafa, J.T. (2008). A Statistical Analysis of 2006 Population Growth Rate in Edo State. *Journal of the Chemistry Advancement Society, 6:* 161 – 168.

23. Ozegin, K.O., Ikhifa, I., and **Ikpotokin, O.** (2008). Enhancing the Quality of Education in Nigeria as it relates to Instructional Physics. *Journal of Academics. 3 (1):* 31 – 36.

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