LEMBAR

HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING INTERNASIONAL

Judul Prosiding (Artikel)	:	Hybrid ARIMAX-ANFIS based on LM Test for Prediction of Time Series with Holiday Effect		
Nama/ Jumlah Penulis	:	P Hendikawati, Subanar, Abdurakhman, Tarno		
Status Pengusul	:	penulis ke-4		
Identitas Prosiding	:	a. Nama Prosiding	:	Journal of Physics: Conference Series International Conference on Mathematics, Statistics and Data Science (ICMSDS) 2020 11-12 November 2020, Bogor, Indonesia
		b. Nomor ISBN	:	17426588
		c. Vol, No., Bln Thn	:	Volume 1863, Issue 119 April 2021 Article number 012061
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		e. DOI artikel (jika ada)	:	
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		g. Terindex	:	Scopus

Kategori Publikasi Prosiding (beri ✓pada kategori yang tepat) :

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Total = (100%)	18,5	18,7	**18,6**
Nilai Pengusul = 40% x 18,6 /3 = 2,48			

Semarang, 15 April 2023

Reviewer 1

Prof. Dr. Widowati, S.Si., M.Si
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Unit Kerja: FSM UNDIP
Bidang Ilmu: Matematika

Reviewer 2

Nama : Prof. Dr. Sunarsih, M.Si
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Unit Kerja : FSM Undip
Bidang Ilmu: Matematika

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d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			5,2
Total = (100%)	**30**			18,5
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4. **Kelengkapan unsur dan kualitas terbitan:**
   Kelengkapan dan kualitas terbitan bagus. Indeks kemiripan = 4%

Semarang, 15 April 2023
Reviewer 1

Prof. Dr. Widowati, S.Si., M.Si
NIP. 196902141994032002
Unit Kerja: FSM UNDIP
Bidang Ilmu: Matematika

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a. Kelengkapan unsur isi Prosiding (10%)	3			2,0
b. Ruang lingkup dan kedalaman pembahasan (30%)	9			5,5
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d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			5,5
Total = (100%)	**30**			18,7
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   Kelengkapan dan kualitas terbitan cukup baik. Indeks kemiripan = 4%

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Reviewer 2

Nama : Prof. Dr. Sunarsih, M.Si
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Preface

In this current data-revolution era, we should be aware that the role of mathematics, statistics, and data science significant in almost all fields of science and business. The speed of the development of those sciences is fast, and it is essential to have an event for exchanging information and sharing knowledge among people around the world. The International Conference on Mathematics, Statistics, and Data Science 2020 (ICMSDS 2020) was held to accommodate that demand.

The ICMSDS 2020 took the theme of "Optimal Data Utilization to Reach Brighter Future" and was organized on November 11 – 12, 2020, through the collaboration between the Department of Statistics and the Department of Mathematics, IPB University. We humbly thank some associations which supported a lot this event, i.e Ikatan Statistisi Indonesia (ISI), Forum Penyelenggaraan Pendidikan Statistika Indonesia (FORSTAT), Indonesian Mathematical Society (IndoMS), and Indonesia Operations Research Association (IORA).

On behalf of the committee would like to share our appreciation to the invited speakers that shared their knowledge and expertise in this very significant conference:

1. Prof. Eric Schoen - KU Leuven, Belgium
2. Prof. Hisyam Lee - Universiti Teknologi Malaysia, Malaysia
3. Prof. Ken Seng Tan - Nanyang Technology University, Singapore
4. Prof Peerayuth - Kasetsart University, Thailand
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7. Prof. Toni Bakhtiar - IPB University, Indonesia
8. Dr. Chuen Seng Tan - National University of Singapore, Singapore
9. Dr. Utami Dyah Syafitri - IPB University, Indonesia

The appreciation also goes to all contributing speakers and participants. During the conference, there were as many as 128 presenters from 37 universities and institutions from 6 countries, namely Indonesia, Malaysia, Nigeria, Bangladesh, Iran, and Japan.

We also want to express our deepest gratitude to the Rector IPB University; Dean of Faculty of Mathematics and Natural Sciences, IPB University; Head of the Department of Statistics, and Department of Mathematics, IPB University; the steering committee; and the organizing committee for their support and assistance in preparation for conducting this conference.

We hope that this event can strengthen cooperation and networking between researchers, participants, and institutions in developing statistics, mathematics, and data science.

Editors
Farit Mochamad Afendi
Agus Mohamad Soleh
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Differential Game of Pursuit Time Satisfy the Geometric Constraints in l_2 Space

Usman Waziri[1*], Gafurjan Ibragimov[2], Abdullahi Usman[1], Babangida Ibrahim Babura[3], and Salaudeed A. Adebayo[1]

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Abstract. In the present article, we present a differential game of pursuit problem with the case of geometric constraint in the Hilbert space l_2. The game is given by system of 2-infinite systems of first order ordinary differential equations (ODEs). Geometric constraint are imposed on the control functions of players. The game is began from a given point z^0 called the initial position. It is given another point z^1 in the space l_2. The Pursuer targeting to bring the state of the system from z^0 to z^1 where an equation to find a guaranteed pursuit time is obtained while that of the Evader action is opposite. The game is assumed to be completed if $z(t) = z^1$ at some time t. Moreover, a control problem is studied and then extended to the differential game of pursuit where the strategy for the Pursuer is constructed explicitly.

1. Introduction

Before going into the literature deeply first must acknowledge the present of famous books by famous mathematicians in the theory of differential games these includes the books of [1], [2], [3], [4], [5], they analyzed the real life conflict problems and lays the strong mathematical foundation for the theory of differential games.

Since then many works by various authors with different approaches had been reviewed and published in advancing the area of differential games for an ordinary differential equations. Moreover, the control functions of the players in the differential games problem are usually subjected to either geometric, integral or both constraints. For examples the work of Chernous' ko [6], [7], [8], [9], [10], [11], [12].

Decomposition method is among the popular method in studying control and the theory differential game problems in systems of differential equations with distributed parameters where the problems can be reduced to the system of infinite system ODEs such as the research work of [7], , [8], [9], [10], [11], [12] [13], [14], [15].

In the work of [11] examined a game of pursuit problem for which the first player tries forward the state of the system from given point into another point in some sense while the second player tries to stop this. The system is described by partial differential equations and the control parameters of the game problem are defined to the right hand side of the equation are in additive form. Therefore, decomposition method and some ideas from research paper of

Construction and Applications of Stairboxplot for Exploratory Data Analysis

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Abstract. The classical construction of boxplot requires estimates of five robust statistics of interest namely; the first quartile, the median, the third quartile, the lower fence and the upper fence. The fence estimate is usually dependent on the three quartiles and is utilized to visually identify outliers in a batch of univariate dataset. Some scholars are critical of the limitation of boxplox to display individual data points, density of observations and distributional shape in multiple batch comparison among to mention. In this paper display enhancement to address the limitations of classical boxplot is proposed according to a new construction method called stairboxplot. The construction begins with display of four stairs of consecutive boxes according to quadbins to replace box and whiskers in the classical boxplot construction and an inscription of individual observations using scale adjusted outlyingness estimate of each data point. The advantage of stairboxplot as a data display toolkit was explored using simulation and real life dataset.

1. Introduction

Visualization techniques is regarded as the most popular exploratory data analysis (EDA) tools for data analytic in the new field of Data Science. Stairboxplot was recently introduced [1] as a data visualization tool that enhance and extend the features of classical Boxplot method in EDA. Boxplot's main features is define according to a resistant rule for identifying outliers in a univariate dataset. The first quartile Q_1 and third quartiles Q_3 are approximate estimates of the lower and upper fourth of a dataset in which Q_2 is the median of the dataset. The resistance rule label observation as "outside" if the observation fall below $Q_1 - 1.5IQR$, or above $Q_3 + 1.5IQR$, where $IQR = Q_1 - Q_3$, the Tukey's classical boxplot rule [2, 3]. Further studies on the classical boxplot construction methods redefine the resistance rule where extensive done [3], [4], [5], [6], [7], [8], [9], [10],[11], [12]

Literature on boxplot construction variants where proposed to incorporate additional display information and requirement. For example the notch boxplot in which the incorporated notch representing confidence interval around the median estimate [13], the curving (circular) boxplot for circular data [14] and the K-boxplot specifically developed for mixture data such that a multi-modality display enhancement was incorporated within the k-boxplot construction method [15].

Robust Normality Test in the Presence of Outliers

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Abstract. In classical statistics, detecting the normality of the data is one of the essential assumptions. However, if the selected random samples have some outliers, this assumption is violated. It is now evident that the Jarque-Bera (JB) test is one of the most powerful tests of normality. The study shows that in the presence of outliers, the JB test does not perform well in many situations. Thus, they proposed a robust Jarque-Bera (RJB) test as an alternative. In this article, we incorporate the idea of Gel and Gastwirth and proposed also a modified Jarque-Bera (MJB) test which has more power than the RJB. The results of the real-life example and simulation study shows that the power of MJB is higher in detecting normality of data compared to the JB and RJB test

1. Introduction

A normality test is used to check the violation of the normality assumption of data. The entire inferential procedure and interpretation of results may be unreliable due to the violation of this assumption. So, it is essential to check the normality assumption before doing any relevant statistical analysis. There are two common ways to check the normality assumption. The easiest way is by using graphical methods. The most popular used graphical test of normality is quantile-quantile (QQ-plot) and histogram, box-plot, and stem-and-leaf plot are the other graphical methods of normality. Another way of checking normality is numerical methods. There are several numerical methods in the literature. Yap and Sim [11] studied and compared the power of Shapiro–Wilk (SW) test, Kolmogorov–Smirnov (KS) test, the Lilliefors (LL) test, Cramer–von Mises (CVM) test, Anderson–Darling (AD) test, the D'Agostino–Pearson test, the Jarque–Bera (JB) test and chi-squared (CSQ) test and found that Jarque–Bera (JB) test is the most powerful test for checking normality of data.

It is now evident that the presence of outliers is very common in real data [9, 2, 7, 6]. Normality assumption is often violated when a dataset contains outliers [8, 4]. Gel and Gastwirth [4] proposed a Robust Jarque–Bera (RJB) test utilizing a robust measure of variance which is less influenced by the outliers. Their study shows that the Robust Jarque- Bera (RJB) test is more powerful than the JB test in detecting moderately heavy-tailed departures from normality. In this article, we proposed another modified version of the Jarque–Bera test, the Modified Jarque–Bera (MJB) test, which gives better power than the Robust Jarque- Bera test proposed by Gel and Gastwirth [4].

The proposed modified Jarque-Bera (MJB) Test is discussed in Section 2. The performance of the proposed MJB test is evaluated through a simulation study in Section 3. A real data example is given in Section 4. Finally, a conclusion is drawn in Section 5.

Generalized Structural Equations Approach in the of Elderly Self-rated Health

Arezoo Bagheri, Mahsa Saadati*

National Population Studies and Comprehensive Management Institute, Statistical methods and population modelling Department, Tehran, IranType the author addresses here

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Abstract. To model classified and ordinal data, the Generalized Structural Equation Model (GSEM), which is based on the integration of two generalized linear model (GLM) and Structural Equation Modeling (SEM) algorithms, is applied. Unlike the SEM, this model does not require the normality assumption. The main purpose of this paper is to introduce and compare weighted (WLSMV) and unweighted (ULSMV) least squares mean and variance adjusted methods, two of the most applicable estimators of GSEM, for studying factors affecting the elderly self-rated health in 2015 in Tehran, Iran. 600 elderly people aged 60 years and above from 22 regions of Tehran were selected using multi-stage sampling. Self-rated health of the elderly variable (a 5-point Likert scale) was analyzed as an ordinal variable and was modeled considering the variables of social support, financial and environment security, spirituality, mental and physical health, functional health and health-related behaviors by Mplus software. The results showed that WLSMV outperformed ULSMV according to the smaller values of RMSEA and larger values for CFI and TLI indexes (RMSEA WLSMV=0.04, CFI WLSMV =0.965, and TLI WLSMV =0.936). To prevent concluding invalid results in studying ordinal data due to considering them as a continues variable, it is important selecting correct statistical method according to the type of variables.

1. Introduction

Likert-type scale items for operationalizing unobserved constructs by using more manageably observed variables in the social and behavioural sciences are employed. Structural equation modelling (SEM) is a group of statistical techniques that investigate the relationships among observed and latent variables. Researchers start with a hypothesized model representing the inter-relationships among variables, and then evaluate if the hypothesized model fits the data well. A model is said to fit the data if the relationships specified in the model adequately reproduce the relationships existing in the data. In SEMs and under the normal theory, continuity and multivariate normality distributed scores of the observed variables are assumed [1]. However, survey data are not frequently collected with these preferred properties and are usually gathered on a Likert scale. So, these kinds of categorical data naturally are non-continuous and often show some kinds of non-normality [2]. The relationship between observed and factor scores for ordered categorical data is non-linear and should be studied by generalized structural equation model (GSEM). If the ordered categorical data are analysed as continuous, the distributions of observed scores can not reveal the true underlying distributions [1], mainly in small number of category conditions like as two-categories. The violation of normality assumption for