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Algorithm Advanced Control Chaos and Stabilization Measurement Error

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Abstract. Measurement error in the data sample human voice from the data 1 to 17 obtain measurement results with the algorithm Advanced Chaos Control and Stabilization through several stages of delivery of the process control and and stabilizing the data to find the value of noise and bias in the initial process control and find the value of precision and accuracy in both the stabilization process. Stable value which must be controlled ranging 58,9922dB and 60,47059dB with a standard value of 60dB.

1. Introduction

Measurement error (error measurement) that occur in any estimation of process data is one of the problems in detecting the quality of data. It refers to the problems resulting from errors of measurement. In general the problem is different from the actual value, the value is recorded to measure several degrees. In the continuous attribute, the numeric differences of measurement results with the actual values called error.

The first noise occurs, the result of measurement error components in random order. Noise related modifications of the true value, such as distortion or storage of voice call while talking to bad people and the "snow" on the television screen. Second, is the variety of measurement of the quantity measured by a reduction between the mean and the value of the quantity. The third is precision, proximity of repeated measurements (quantity) of each other. As measured by the standard deviation. The fourth is the accuracy, the measurement of a distance to the true value of the quantity being measured. To avoid errors in measuring data, required the presence of control more quickly. Detect problems on measurement errors. In this type of reference to use as noise, bias, precision, and accurate data if alowed occurs continuously in the data processing will result in chaos or the existence of irregularities in the data so it will happen the deviation of measurement error and of course will affect data quality, data quality will produce accurate information.

2. Methodology

Measurement error is the difference between the true value and the measured value of a quantity that exists in practice and may considerably affect the performance of control charts in some cases.

Measurement error variability has uncertainty which can be from several sources [1]. Four sources of measurement error-the questionnaire, the data-collection mode, the interviewer, and the respondent-are discussed, and a description of how measurement error occurs in sample surveys through these sources of error is provided. Methods used to quantify measurement error, such as randomized experiments, cognitive research studies, repeated measurement studies, and record check studies, are described and examples are given to illustrate the application of the method [2].

To quantify the various sources of error, both chance and systematic, in the measurement of low IQ in order to get an estimate of the degree of accuracy to which true intellectual ability can be measured in the low range. Some of these errors are more easily quantified than others and combining error from various sources can only be done by making assumptions Therefore any estimate of the overall degree of accuracy with which true intellectual ability can be measured must be regarded as tentative, nonetheless it is hoped that doing this will be informative [3]. The need for improvement in current diet methods or development New techniques have been handled often because there is no diet method ideal currently available. It is understood that the results of the method a diet with seemingly simple questions is the result of cognitive processes and behaviors that are complicated and thus including various sources of measurement errors. 2 errors classification can change the estimation of relative risk in both directions. Different statistical methods have been proposed to adjust measurement error in research design. Apply the model assuming a non-differential error while [4], [5] Measurement uncertainty is a measure of the distribution of measurement Results. Design to further evaluate the effect of survey length on measurement error and to examine the degree to which a split questionnaire design can yield estimates with less measurement error [6].

Measurement error in network data has typically focused on missing data [7]. Models For Measurement Error A fundamental prerequisite for analyzing a measurement error problem is specication of a model for the measurement error process. The classical error model, in its simplest form, is appropriate when an attempt is made to determine X directly, but one is unable to do so because of various errors in measurement. For example, consider systolic blood pressure (SBP), which is known to have strong daily and seasonal variations [8]. The Consequences of Measurement Error when Estimating the Impact of BMI on Labour Market Outcomes [9].

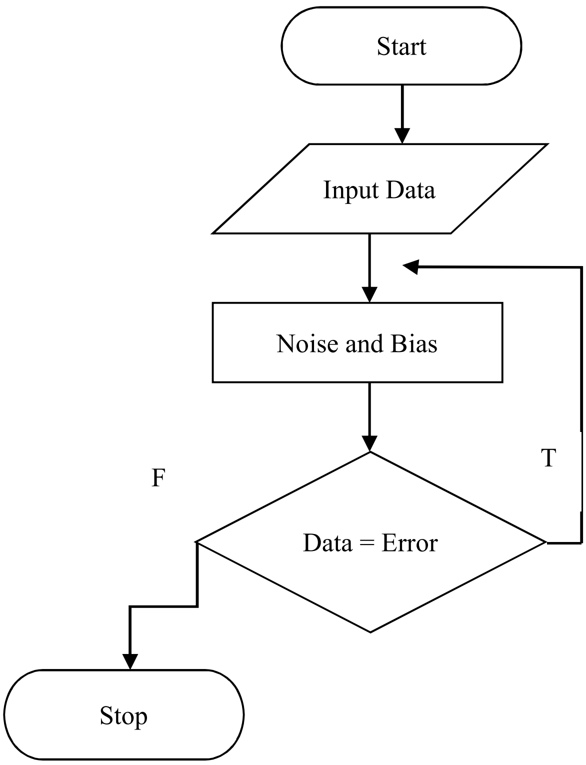

Figure 1. Phase 1 - Algoritma Control

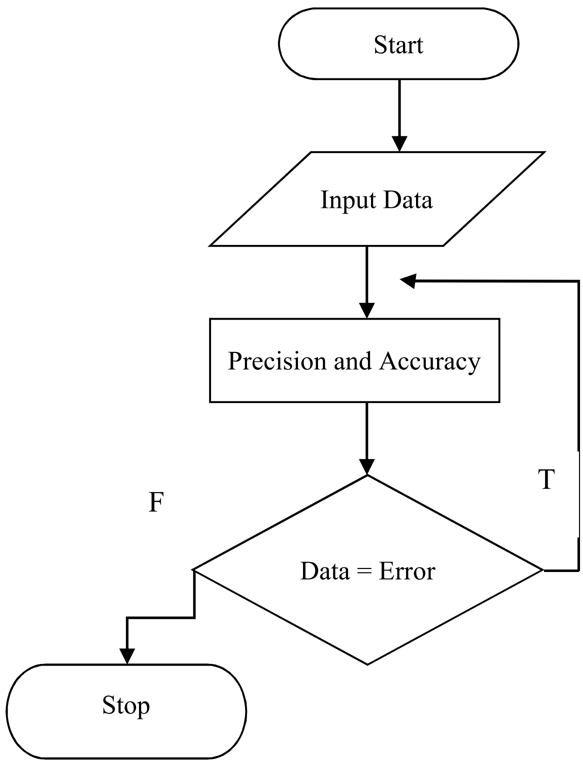

Figure 2. Phase 2 - Stabilization Algorithm

2.1. Advanced algorithms Stabilization Control And Measurement Error

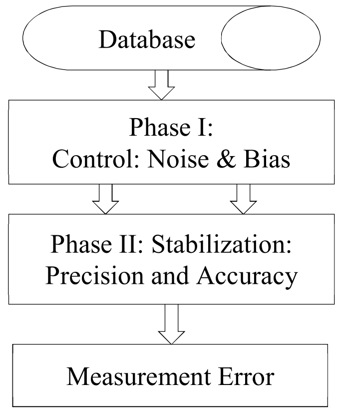

Figure 3. Model AACCSME

Phase I: Control (Noise and Bias)

a. Finding Value Noise on sound data

   Formula : $\frac{\text{Data1 + Data2 + Data3...Data n}}{\text{n}}$

   Make a summation process to Data1 - Data n divided by the number of data (n).

b. Finding Value Bias:

   Formula: Bias = Noise - Standard Value

   Further more, the process of reduction is reduced by Noise Value Value Standard.

Phase II: Stabilization (Precision and Accuracy)

a. Finding Value Precision

   Formula : Precision = $\frac{\sqrt{(Data\ 1-Mean)^2+(Data2-Mean)^2}}{n}$

   Accuracy (%) = [True Value - Analysis] / [True Value] * 100

3. Results and Discussion

3.1. Data Preparation

Figure 4. Noise Measurement With Sound Meter

3.2. Implementation

Tabel 1. Sound intensity measurement results of 17 people

Voice To	Sound Intensity
1	53 dB

Voice To	Sound Intensity
2	46 dB
3	50 dB
4	68 dB
5	72 dB
6	47 dB
7	43 dB
8	49 dB
9	41 dB
10	48 dB
11	45 dB
12	77 dB
13	73 dB
14	88 dB
15	81 dB
16	78 dB
17	69 dB

3.3. Manual Calculation Process With AACCSME algorithms:

Phase I: Control

a. Looking average Mean Values human voice during a call (dB)
   Noise = (53 + 46 + 50 + 68 + 72 + 47 + 43 + 49 + 41 + 48 + 45 + 77 + 73 + 88 + 81+ 78 + 69) / 17
   = 60.47059 dB
b. Looking average value Bias
   Standard value: 60 dB Bias = 60.47059 - 60 = 0.47059

Phase II: Stabilization

a. Looking average value Precision
   (53 - 60.47059) 2 + (46 - 60.47059) 2 + (50 - 60.47059) 2 + (68 - 60.47059) 2 + (72 - 60.47059) 2 + (47 - 60.47059) 2 + (43 - 60.47059) 2 + (49 - 60.47059) 2 + (41 - 60.47059) 2 + (48 - 60.47059) 2 + (45 - 60.47059) 2 + (77 - 60.47059) 2 + (73 - 60.47059) 2 + (88 - 60.47059) 2 + (81 - 60.47059) 2 + (78 - 60.47059) 2 + (69 - 60.47059) 2) / 17 = 15.70477
b. Finding the average value of accuracy
   ([60 - 60.47059] / 60) = 58.9922

3.4. Test Algorithm Programming R AACCSME With On Data

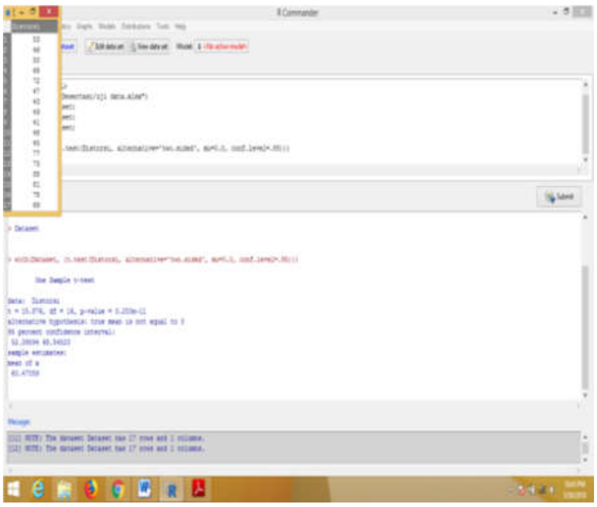

Figure 5. Mean

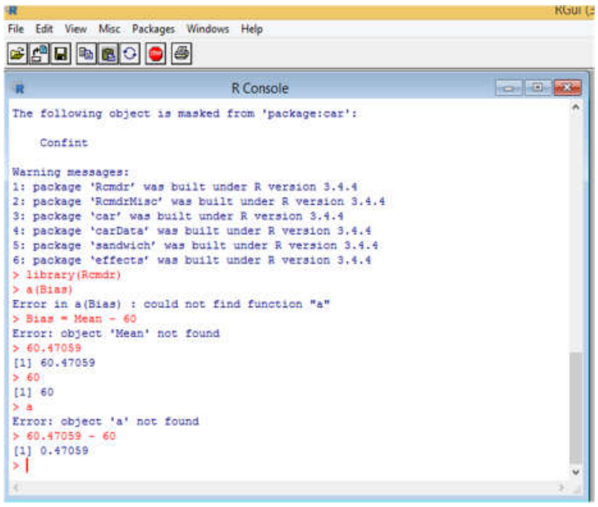

Figure 6. Refraction

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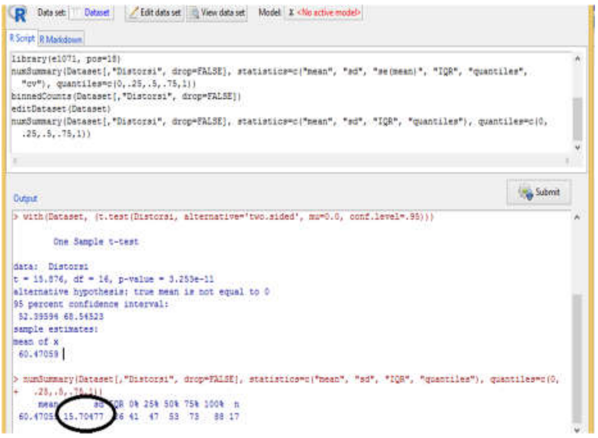

Figure 7. Standard Deviation (Precision)

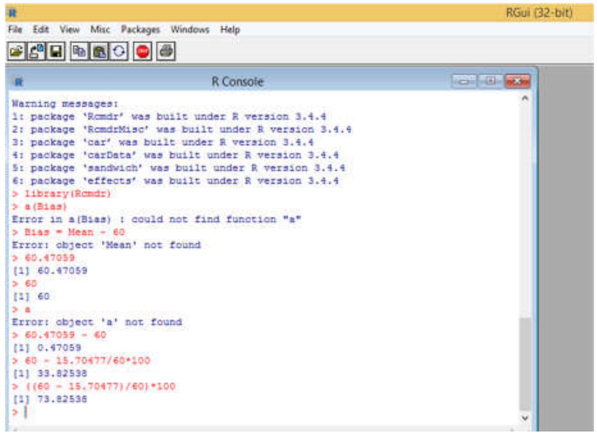

Figure 8. Accuracy

3.5. Noise Value Per Calculation Result Data

Tabel 2. Noise Value Per Calculation Result Data

Votes	large Noise	Value Standard	Noise value
1	53 dB	60 dB	7
2	46 dB	60 dB	14
3	50 dB	60 dB	10
4	68 dB	60 dB	-8
5	72 dB	60 dB	-12
6	47 dB	60 dB	13
7	43 dB	60 dB	17
8	49 dB	60 dB	11
9	41 dB	60 dB	19
10	48 dB	60 dB	12
11	45 dB	60 dB	15
12	77 dB	60 dB	-17
13	73 dB	60 dB	-13
14	88 dB	60 dB	-28
15	81 dB	60 dB	-21
16	78 dB	60 dB	-18
17	69 dB	60 dB	-9

3.6. Results AACCSME algorithm with MATLAB Programming 2015a

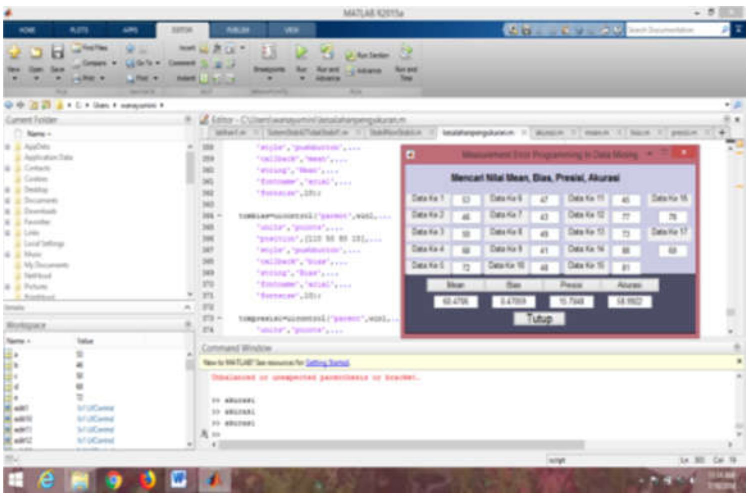

Figure 9. Results AACCSME Algorithm eith MATLAB Programming 2015a

Advanced Control And stabilization of Chaos is an algorithm that will be used to do the process control on the data so that the Measurement Error does not occur if left it will be Chaos going on. Measurement of distortion or aberration voice while talking a bad call (acoustic noise). Data quality can be measured through the Measurement Error are: Noise, Bias, Accuracy and Precission. Acoustic noise is sound that comes from other sources around the ring like the sound system and more..

4. Conclusion

The average value (Mean) Frequency Sound in a few minutes of data samples from the human voice sound intensity of 1-17 is equal to 60.4706 dB. Variation value measurement of sound intensity data quantity of data samples 1-17 with a reduction of between Mean and quantity of data is known (Bias) is approximately 0.47059 dB. Value proximity repeated measurements of the same quantity as the others on the intensity of noise in the data sample 1-17 (precision) is equal to 15.7048 dB. To closeness value measurement true value of the quantity measured on the sample data of sound intensity 1-17 (Accuracy) is equal to 58.9922 dB. Values above is based on the value of the interval Upper: 53dB, Interval Lower: 69dB, and the interval Tengah: 41dB. Based on calculations of data samples 1-17, the stable value which must be maintained in order to avoid chaos ranged 58.9922dB and 60.47059dB and standard value of 60dB.

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