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Approximation of Similarity Failures by Homogeneous Poisson Process

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ABSTRACT

Software growth models depend on one key assumption about evolution of software systems. It is by continuously identifying and removing the faults whenever failures are identified. This processes to increases the reliability of the software. The data on failures and fixing of the faults is typically obtained during the final stages of testing. In this paper, we proposed an Independence Test conduct on angle oriented images to increases the reliability. A Homogeneous Poisson Process is used for the no.of images recognition occur constant in a unit time interval and failure data is acceptable for software reliability and failure pose parameters are estimate using Least Square Estimation. To find the reliability of the Independence on angle oriented data we used Nelson model and exponential based Goel–Okumoto model.

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INTRODUCTION

In general after developing any application, before actual deployment and usage of it in the required system, it has to be tested for its validity thoroughly. Testing will increase the value of the developed application. Software testing is an activity that is used to evaluate the capabilities of a system and determine if it is in accordance with the specifications. Testing is an effective method for detecting errors in order to remove them. The effective testing process involves improving and assuring software quality, verification and validation, and estimating reliability.

Most of the studies are assumed to examine the software error occurrence phenomenon. Our intention is to improve the software performance with the help of such studies, and it can be two types. One is highlighting the experimental analysis of data collected from software products. The last one deals with the development of models for measurable assessment of software performance. Most of such models assume that the time to time failure follows an exponential distribution. At this time, it may be emphasized that a software system is a product of human work and is very likely to contain faults. When a human makes a mistake in performing some software activity then version to IEEE a fault occurs. Here, is not much distinction between faults, error or bug as their effect is the same specially called software failure. A failure is a departure from the system's required behavior for which it is intended to work. Some faults may not turn into a failure. At the same time software cannot be made totally fault free. These hidden faults lead to software failures i.e., a fault is unobservable unless a failure is experienced. Some faults remain to be unobservable even if failures are noticed. This requires development of software that keeps special emphasis on minimizing the number of defects in the software. In software engineering, reliability is a discipline that make confirms failure free operation of software at the end-user by employing scientific techniques to remove the maximum number of faults. The quality of the software system has many attributes such as maintainability, portability, usability, security, reliability, availability. The software reliability is the most dynamic attribute in which can measure and predict the operational quality of the product. In this paper, we proposed a pose oriented image data failure defects taken from software recognition process at the time of continuous processes, used for recognition process is completed to estimate the failures with the help of multivariate based Independence test method. Also we have used Nelson model and Goel-Okumoto Model based for software reliability testing**.**

This paper we organized as follows: Section I deals with pose oriented based failure data Independence tested using Multivariate analysis. The homogeneous based poisson process is presented in section II. In section III, it deals with least square estimation with pose oriented failure data. Section IV is discussed about finding software reliability. Conclusion is in section V.

1. Failure Inference Using Independence Test

Every detection system is science of a programming computer recognize the human face. The major weakness in face recognition system in-depth pose verification problem Ting Shan et al discussed in Face Recognition to Head Pose from One sample Image proceedings, 2006 [6] is faced in over the last decades. Jagan Mohan et al., 2011 [2] discussed in increasing the reliability of angle oriented face recognition using DCT already proved. Unfortunately, some of the poses are not matched with database image with both are same person due to rare condition. So, we are going to improve the increase the reliability. To conduct the Independence test in Multivariate analysis is a graphical tool mainly used to find patterns and relationships between several variables simultaneously is discussed by Kapur et al [7] has given the idea of Fundamentals of Mathematical Statistics.

Let X is a normal random vector. The components are independent iff they are uncorrelated. i.e.., $Cov(X_i, X_j)=0$ then they are uncorrelated so the two components X_i and X_j are independent.

In this paper, we used this extraordinary property in the following two cases

Case 1. We have to compare all poses of images and check whether all are belongs to one input image or not. In this case if they are not uncorrelated then all shape of images belongs to one particular image. i.e., Cov (X_i, X_j) $\neq 0$ and X_i, $X_j \in$ C (X_i, X_j are from poses of images) so that means they are not independent, which means that which have relation between these poses.

Case 2. After succeeded from step 1, among all poses of images we have to test whether all poses are match with the database image. In this case we have to test the independency property between database image and the poses of images. After exemplify we can get 0 or not equal to 0.

a) If Cov (X_i, X_j) $\neq 0$ then all poses are matched with the database pose. In this case we have to pick the target inference by human assumption.

b) If Cov (X_i, X_j) =0 it means that any one of the pose is independent to database image, which means it is not recognize the database image so we are unable to find target inference but it is very rare,

Hence this independence test has failure while recognizing the target inference on homogeneous data. Now we have to check the software reliability of the independency test of the angle oriented recognition system. HPP is suitable when failure occur in rare condition on homogenous data. It is mentioned in below section.

2. HPP on Pose Oriented Failure Images

For each process to identify the specified point and remove faults namely debugging process. The consecutive of failure incidence and fault removal can be utilized to provide an estimate of the software reliability and the level of fault content. Software reliability model is a tool that can be used to evaluate the software performance quantitatively. Software reliability models can be classified according to probabilistic assumptions. The fault counting model includes the models which describe the failure phenomenon by stochastic process like Homogeneous Poisson Process (HPP), Non-Homogeneous Poisson Process (NHPP), and Compound Poisson Process. A popular of failure count models are based upon HPP described in the following lines.

In this, a Poisson process is a stochastic process which counts the number of actions and the time that these actions occur in a given time interval. The Poisson process is a continuous-time process.

The random variable X(t) does depend upon N(t) means no.of images at the time t. $X(t_x)$ is as follows: $X(t_x)$ means no.of images at the time t_x.

$$P[X(t)=j \mid X(t_x)=i]=P[X(t)-X(t_x)]=j-i$$

Where
P[X(t) =j| Process Ending Time], P[X(t) =i| Process Starting Time], j-i represents the Process Execution Time.

Now, we represent X(t)

$$\int_0^t x(t)dt = 0 \leq x(t) \leq t$$

It is a continuous-time process whereas in this process, the no.of images recognition occur constant in a unit time interval. So this process is homogeneous Poisson process. Now we conclude, in this process is characterized by a recognition parameter λT is discussed by satyaprasad, 2011 [4, 5].

This relates is represented by

$$P[X(t) - X(t_x) = K] = \frac{e^{-\lambda T}(\lambda T)^K}{K!}, \text{ K=0, 1… x}$$

where K is the no.of recognitions in the time interval (t, t_x).

3. Least Square Estimation

Parameter Estimation plays a key role for reliable prediction of software. To estimate the value of one variable with the value of the other variable this is known as unbiased. The statistical method which helps us to estimate the unknown value of one variable from the known value of the related variable is called regression. In this approach, there are two methods for studying regression namely Graphic and Algebraic method. In this paper, we study the pose oriented failure data set used an algebraic method is also called as least square estimation. It indicates the best possible mean value of one variable corresponding to the mean value of the other. Here, we can compute the pose oriented data set coefficients of the equation Y=a+bX by solving the normal equation.

Regression equation of Y on X:

$$\sum y = b\sum x + Na$$

$$\sum xy = b\sum x^2 + a\sum x$$

S.No.	Input Images X	Output Images Y	X^2	X.Y
1	1.0445	2	1.09098	2.089
2	1.0536	3	1.110073	3.1608
3	1.0659	6	1.136143	6.3954
4	1.0839	11	1.174839	11.9229
5	1.0876	12	1.182874	13.0512
6	1.093	16	1.194649	17.488
7	1.1168	19	1.247242	21.2192
8	1.1422	19	1.304621	21.7018
9	1.1517	20	1.326413	23.034
10	1.1901	22	1.416338	26.1822
11	1.2191	23	1.486205	28.0393
12	1.225	25	1.500625	30.625

Table 3.1: Pose Oriented Failure Data

S.No.	Least Square Parameter Estimation
1	a=15.327873, b=--0.4404565

Table 3.2: Pose Oriented Failure Data Least Square Estimation Values

4. Finding Software Reliability

Jagan Mohan et al is given Nelson model to estimate reliability of the software for angle oriented approach in Efficient K-Means Cluster Reliability on Ternary Face Recognition using Angle Oriented Approach, published in International Journal of Informatics and Communication Technology (IJ-ICT) Vol.2, No.1, January 2013[3].

$$R = 1 - \frac{no.of\ failures}{no.of\ runs}$$

$$R = 1 - \frac{12}{90} = 0.87 < 1$$

We applied the least square estimation to estimate parameters, which is shown in above section. The following is the pose oriented failure graph of the table 3.1.

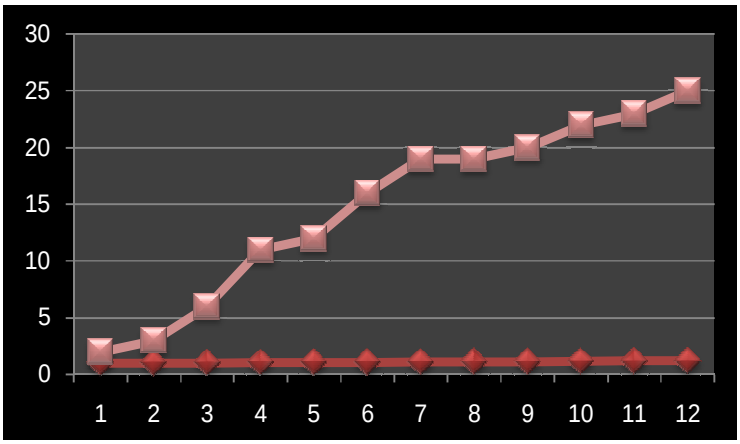

Fig 4.1: Pose Oriented Failure Graph

To increase the reliability of angle oriented system, exponential model is used when graph in Concave shape.

A software system is focus to failures at random times caused by errors present in the system. The cumulative number of software failures by time t are taking to this function{x(t), t>=0}. m(t) is the mean value function to represent the expected number of software failures using time t. λ(t) is failure intensity function, which is proportional to the remaining fault content is suggested by A.L.Goel et al. [1]. Therefore

$$m(t) = a(1-\exp[-bt]), \qquad a>0,\ b>0,\ t>=0$$

and the intensity function of this model is given as

$$\lambda(t)=a\ F'(t),$$

Here, 'a' is the initial fault contained in a program and b represents the fault detection rate. In software reliability, the initial number of faults and faults detection rate are always unknown.

So, we conclude that the expected failure recognition rate is decreases m(t) = -7.1574**<1**

5. Conclusion and future perceptive

This paper proved an Independence Test conduct on pose oriented images to increases the reliability of detection system. In this paper, HPP is calculated to check whether failure data is reliable or not and also to estimate the parameters Least Square Estimation is used. Finally in the last section we discussed the finding reliability using nelson model and exponential model. The experimental result is shown in section 3 and 4. In future direction, the data can be grouped into clusters and also non-homogeneous poisson process is used to find the reliability of failure angle oriented images.

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