Monthly Presentation By Research Scholars

Talk -1

Speaker : Kavya P
Date : 16/06/2022
Title : Some Parsimonious Models for lifetime and Applications

Abstract : The principle of parsimonious modeling of lifetimes has regained its importance in recent times. The value of stochastic modeling in dealing with the inevitable uncertainty and risk is nowadays highly appreciated. However, several families of distributions/models used in stochastic modeling of lifetimes are often non-parsimonious, unnatural, theoretically unjustified, and sometimes unnecessary. In this paper, we propose a transformation for obtaining a new class of distributions. The distributions obtained from this transformation are parsimonious. Here We introduce two new distributions using exponential and Weibull distribution as the baseline distribution for this transformation. The behavior of hazard rates of the new distributions are examined along with other analytical properties. Parameter estimation of the proposed models is done by using the maximum likelihood method. Simulation studies are carried out to assess the performance of the estimators. We have shown that the parameters estimated from the distributions are consistent. Further, the new parsimonious life distributions are applied to a set of real data. We compare our results with various distributions in the literature and find that our lifetime models provide a better fit to the data sets.

Talk -2

Speaker : Prasily P
Date : 29/06/2022
Title : Big Data in Official Statistics

Abstract : Today, the global population is connecting with data. Data can be of various types; understanding this data is crucial for its proper analysis and interpretation. This paper covers a brief outline of data science, particularly in the era of big data. The purpose of the study is the usage of big data in official statistics, including the impact of covid-19 in official statistics. The SARS-CoV-2 coronavirus, which jolted the entire world with its outbreak, the governments of many countries tremble to the bottom of their economies, and people's health. It leads the world to switch the ways of working and make the people stay at their homes. Finally, Covid-19 left the world to num for the entire year. This paper investigates the massive challenge Covid-19 has impacted official statistics in India. Also, we offered different statistical visualizations of the recent status and vaccination of the world covid-19 data, particularly analyzing the statewide Indian data, then did the correlation and clustering analysis and proved how official statistics is assisting our Nation.

Talk -3

Speaker : Fasna
Date : 13/07/2022
Title : Some Generalizations of Cauchy Distribution

Abstract : In this paper, we introduce a new four-parameter distribution called the new generalized Cauchy distribution (NGC). The structural properties of the new distribution are discussed. Expressions for the quantiles, mode, mean deviation, and distribution of order statistics are derived. It is shown that the distribution belongs to the class of subexponential distributions. NGC has regularly varying tails and is a member of the class of heavy-tailed distributions. It is shown that the tail weight of NGC is higher as compared to the Cauchy distribution. Parameters of NGC distribution are estimated by the percentile method, method of quantile least square, Cramer-Von Mises method, and method of maximum likelihood. Monte Carlo simulation is performed in order to investigate the performance of quantile least square estimates, Cramer-Von Mises estimates, and maximum likelihood estimates. The existence and uniqueness of maximum likelihood estimates are proved. The application of two real data sets shows the performance of the new model over other generalizations of Cauchy distribution.

Talk -4

Speaker : Praveen V P
Date : 26/07/2022
Title : Analysis of Inventory control

Abstract : Deterministic inventory control models for stochastic deteriorating items have been extensively studied in the past. However, there is not much work reported to model situations where different phases of deterioration rate are prevalent. In this paper, We develop a deterministic inventory control model with stochastic deterioration incorporated through additive Weibull distribution. In this study an elegant approach is proposed to consider a time dependent demand in the planning process and we consider that the holding cost totally depends on time and shortages are allowed for this model. The objective is to minimize the total inventory cost of the proposed model. Finally the formulated model is illustrated through numerical examples and the sensitivity analysis is reported to determine the effectiveness of the proposed model.

Talk -5

Speaker : Amjish. P. B
Date : 11 / 08 / 2022
Title : Generalized Gauss Hypergeometric Distribution

Abstract: **In this paper, we introduced a six parameter Generalized Gauss Hypergeometric distribution as an extension of generalized beta first kind distribution. Studied its structural properties and derived some characterizations based on truncated moments, hazard rate and reverse hazard rate functions. As a special case of this six parameter distribution, two parameter Geometric Maximum Power Function (GMPF) distribution is introduced. GMPF distribution is capable of modeling data with increasing, decreasing and bathtub hazard rates. This distribution has a unimodal density function. The model parameters are estimated by the method of Maximum Likelihood. We investigate the potential usefulness of the proposed GMPF distribution model for a real data set. The new model provides a better fit to the data than the competitive models. We develop an AR(1) model with GMPF distribution as marginal distribution.**

Talk -6

Speaker : Salima P
Date : 20/10/2022
Title : Adaptive Queueing Systems

Abstract : Queueing theory is the mathematical study of waiting lines or queue. The theory enables mathematical analysis of several related processes, including arriving at the queue, waiting in the queue and being served by the server(s) at the front of the queue. The formation of a queue is a common phenomenon which occurs whenever the current demand for a service exceeds the current capacity to provide that service. Queueing systems are successfully used for the performance analysis of different systems such as computers, communication, transportation and manufacturing etc. The kind of queueing systems where the arrival rate and/or service rate depends on the number of customers already in the system are called state-dependent or adaptive queueing systems. The study of state dependent queueing models is motivated by queueing scenarios where the arrival rate and/or the speed of the server depends on the amount of work present like production systems and internet. In this study we discuss four linear models and compare numerically the performance measures of the state dependent models with M/M/1 model.

Talk -7

Speaker : Rehana C J

Date : 27/10/2022

Title : Estimation of Stress Strength Reliability using Advanced Sampling Methods.

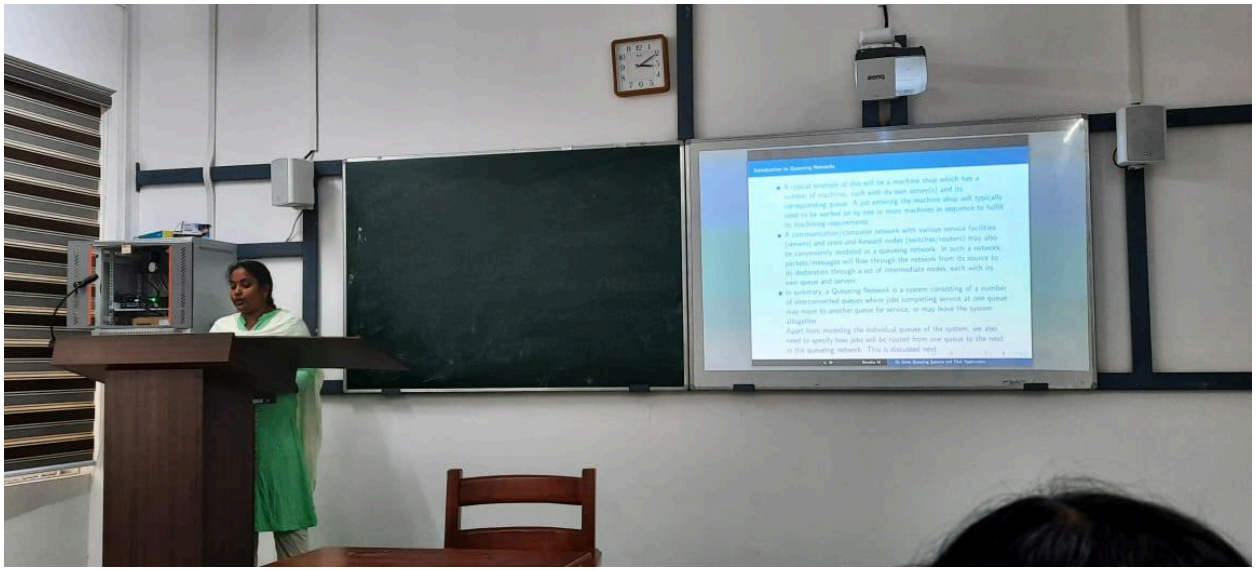
Abstract : In reliability theory, the problem of estimating stress strength has many applications. The stress-strength reliability R = P(X<Y) is used to describe the survival rate of a component which has X as stress applied and Y as the strength of the system. In this presentation, we investigate the estimation of R in the case where X and Y are independent random variables each having a New Generalized Pareto distribution based on some advanced sampling methods. The suggested sampling methods are simple random sampling, ranked set sampling and percentile ranked set sampling. We propose the maximum likelihood estimator of R, when the observations of the two random variables are selected using simple random sampling, ranked set sampling and percentile ranked set sampling respectively. The performance of the proposed estimators of R based on ranked set sampling and percentile ranked set sampling with the simple random sampling equivalent is compared via a simulation study. The efficiencies of these estimators are measured using the ratio of mean square errors. Real data set is also analyzed for illustrative purposes.

Talk -8

Speaker : Nimisha M
Date : 23/11/2022
Title : On Some Queueing Systems and Their Applications

Abstract : Queueing systems are models of systems providing service. Such a model may represent any system where jobs or customers arrive looking for service of some kind and depart after such service has been provided. Queueing Network is a system consisting of a number of interconnected queues where jobs completing service at one queue may move to another queue for service, or may leave the system altogether. The basic polling system is a queueing model in which customers arrive at n queues according to independent Poisson processes, and in which a single server visits those n queues in cyclic order to serve the customers. We describe the most successful application areas of polling models in Computer-communication systems, Production systems, Traffic and transportation systems, Health care, Mail delivery, Shipyard loading, Dynamic Picking Systems, Elevators and Maintenance. In our study, we consider a polling model to minimize waiting time at traffic signals. This is done by regulating the

time a signal remains in ON position using a random clock. Suppose that the signal is on for vehicles to move in a particular direction. Suppose that all vehicles in that queue have been served but time is left to go from Green to Red. In this case, the moment the last vehicle leaves with no vehicle in sight for service, a clock of random duration starts. This clock has a stochastically much shorter life than the residual time left for moving from green to red. If no vehicle comes for service in this queue during ON time of this clock, the signal is turned red the moment the clock realizes. Then the signal gets turned (Green) for the next waiting line (in a cyclic order). These modifications results in considerable reduction in traffic jams at junctions.



Talk -9

Speaker : Arya Damodharan

Date : 07/12/2022

Title : Phase Type Distribution in (S-1, S) Inventory Model

Abstract :Phase Type(PH) distribution has gained widespread acceptance because of its computational properties in applied stochastic modelling. A number of works that are discussed in literature on uses of PH distribution in inventory modelling. In all the works, phase type was used to represent uncertain demand or uncertain lead-time distribution or as both. We can make use of PH distribution to model the (S − 1, S) systems which are typically used for long production time, capital intensive, low demand service parts in industries such as aerospace. In this presentation a detailed discussion of PH distribution and (S-1, S) policy were done. Also, the presentation discussed the new model which uses the (S−1, S) policy in the production inventory model where both demand and production rates are assumed to follow Continuous Phase Type(CPH) distribution.

Talk -10

Speaker : Jiji Jose

Date : 21/12/2022

Title : On discretization of continuous random variables and their applications

Abstract: Discrete distributions have their importance in modelling count data in several applied fields such as epidemiology, public health, sociology, medicine, and agriculture. The family of Pareto distributions is well known in the literature for its capability in modelling heavy-tailed data. Various generalizations of this distribution have been reported in the literature by several authors. This paper discusses the estimation of the parameters of Discrete New Generalized Pareto (DNGP) distribution. Here we assess the performance of the maximum likelihood estimation method in determining the parameter estimates of the DNGP distribution. Simulation studies carried out show that the MLE significantly outperformed other methods. A real dataset confirmed that the MLE method is very much suitable for estimating the DNGP parameters.

Talk -11

Speaker : Anand R

Date : 15/03/2023

Title :

Abstract :

Talk -12

Speaker : Safwana P M

Date : 15/03/2023

Title : Bayesian Parameter Estimation for Type-I Extreme Value Distribution under Symmetric and Asymmetric Loss Functions.

Abstract : Bayesian analysis of extreme value distribution have a long history. Most of the works are concentrated on the prior distribution and elicitation of hyperparameters. They use squared error loss function and consider the posterior mean as the Bayes estimator. Here we add a brief story of symmetric and asymmetric loss functions and their corresponding Bayes estimators. A new class of loss functions is proposed and the Bayes estimators are derived for this class of loss functions. Based on these estimators, we estimate, the location and scale parameters of type I extreme value distribution. Numerical analysis using Monte Carlo simulation is carried out to evaluate the performance of estimators on the basis of simulated absolute bias and posterior risk. This literature aims to find the best estimator in terms of absolute bias and posterior risk under a number of loss functions. We use two distinct prior distributions for the location parameter and scale parameter. Since the posterior distributions have no closed form, we use the Lindley approximation method to derive estimates.