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Biometrics & Biostatistics International Journal

Research Article

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Gumbel - Pareto distribution and it's applications in modeling COVID data

Volume 10 Issue 3 - 2021

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Received: September 15, 2021 | Published: September 30, 2021

Abstract
 A new distribution namely Gumbel - Pareto from Gumbel - X family is introduced. Some properties including moments and order statistics are studied. A reliability measure for stress - strength analysis is derived. The method of maximum likelihood is proposed for estimating the distribution parameters. The flexibility of the new model is illustrated using two examples including Covid data.

Keywords: Gumbel distribution, gumbel - X family, gumbel - Pareto, order statistics, pareto distribution, stress - strength reliability, T - X family

Introduction
 Statistical distributions play an important role in parametric inference and are commonly applied to model real life data. In practical situations, existing standard distributions do not provide good fit to all types of real data sets. Hence statisticians are developing many new distributions which are flexible than standard distributions for the analysis of real data. New distributions are developed either by combining two or more existing distributions or by adding extra parameters to the existing distributions.

The beta generated family of distributions and Kumaraswamy generated family of distributions are generated by using distributions with support between 0 and 1 as the generator. As an extension, Alzaatreh et al.³ proposed a general method by replacing the beta pdf with any non - negative continuous random variable T as the generator and another function $U(F(x))$ which satisfies the following conditions:

i. $U(F(x)) = [a, b]$

as "Transformed - Transformer" or "T - X" family of distributions. A large number of distributions, continuous and discrete, can be generated by applying any two existing univariate distributions based on this method. Alzaatreh et al.³ gave several choices of $U(F(x))$ depending upon the support of the random variable T.

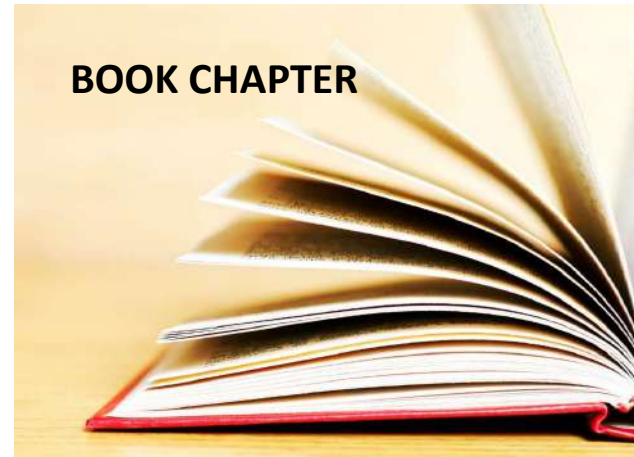
When the support of T is bounded or support of T is $[0, 1]$: In this case $U(F(x))$ can be taken as $F(x)$ or $F^a(x)$. This leads to the beta - generated family of distributions.

When the support of T is $[0, \infty)$, $a \geq 0$: Without loss of generality, we assume $a = 0$. Then $U(F(x))$ can be defined as $-\log(1 - F(x))$, $F(x)/(1 - F(x))$, $-\log(1 - F^a(x))$ and $F^a(x)/(1 - F^a(x))$, where $a > 0$.

When the support of T is $(-\infty, \infty)$: Then $U(F(x))$ can be taken as $\log[-\log(1 - F(x))]$, $\log[F(x)/(1 - F(x))]$, $\log[-\log(1 - F^a(x))]$ and $\log[F^a(x)/(1 - F^a(x))]$.



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BOOK CHAPTER

01

NATIONAL / INTERNATIONAL CONFERENCES



MAHATMA GANDHI UNIVERSITY, KOTTAYAM, INDIA
School of Mathematics and Statistics & School of Data Analytics

International Conference on Mathematics, Statistics and Data Science (ICMSDS-2022)
 | 26-27 February 2022 |

About the Conference
 Welcome to ICMSDS-2022!

We warmly welcome you to participate and contribute to the International Conference on Mathematics, Statistics, and Data Science (ICMSDS-2022), which will be held during 26-27 February 2022 at Mahatma Gandhi University, Kottayam, Kerala, India, organized by the newly established School of Mathematics and Statistics & School of Data Analytics.

Mathematics and Statistics along with Computer Science form the pillars of the emerging areas of Data Science and Data Analytics. In this new data driven world, the importance of interdisciplinary studies and research in Mathematics and Statistics has increased more than ever and big data challenges have made it necessary to develop more advanced models and techniques. Academia and Industry has to come together to address these issues. India had a strong tradition of great scholars in Mathematics and Statistics; and we have made a mark in the field of Computer Science at global level.

The goal of ICMSDS-2022 is to bring together outstanding scholars, postgraduates and students across the world who are interested in further improvement of the state of the art research in Mathematics, Statistics, and Data Science for the purpose of exchanging information across a wide variety of disciplines and communities. Researchers and practitioners are expected to provide new perspectives for cross-disciplinary collaboration and inspire inspiration to help foster creative discoveries. The conference's themes are therefore "Recent Trends in Mathematical and Statistical Sciences and Data Science."

Due to the current pandemic situation, conference will take place in online mode. We solicit your wholehearted support and active involvement for the success of ICMSDS-2022.

About the University

Mahatma Gandhi University, Kottayam established on 2nd October 1983 is one of the major Universities in Kerala, that strives to fulfill the higher educational needs of the people of Central Kerala. The University was accredited "A" by NAAC with a score of 3.24 points in 2017, and was ranked 34th in National Institution Ranking Framework (NIRF) and included among the top 25 educational institutions in the All Ranking of Institutions on Innovation Achievements (ARIA) -2020, conducted by the Ministry of HRD. The Council of Scientific & Industrial Research (CSIR) ranked the University 13th in India in terms of intellectual productivity and National Institute of Science, Technology and Development Studies (NISTADS) rated 19th in terms of h-index of the science faculty. Department of Science and Technology (DST) also ranked the University 8th among the 29 Universities under the Promotion of University Research and Scientific Excellence (PURSE) programme. Recently, Times Higher Education ranked MGU 141 among the world's emerging universities and 13th in India Today-MDRA Ranking 2018.

The University has won the Chancellor Award for the Best University in Kerala for 3 times in 2020-21, 2017-18 and 2015-16. The present Vice-Chancellor Prof. Dr. Sabu Thomas, is a world renowned top ranking scientist and researcher in Nano Science and Technology and Polymer Science in the area of Chemical Sciences. There are many other distinguished scholars among our faculty.

For more details visit www.mgu.ac.in

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Background and Images: Kamaladevi Back Waters: View More



Second Announcement

41th Annual Conference of the Indian Society for Medical Statistics

Date: 2-4 November 2023

National Conference on Emerging Developments in Medical Statistics and Biostatistics in the Era of Data Science

Pre Conference Workshops on 01-11-2023

1. Bayesian Computing and MCMC Methods
2. Data Analytics and Machine Learning for Clinical Research

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