

# LIST OF PUBLICATIONS

## Maheshtala College 2019-2024

*Number of research papers published per teacher in the Journals notified on UGC CARE list during the last six years – 17*

Year	2019	2020	2021	2022	2023	2024
No. of publications	03	01	NIL	03	07	03

### List of Journal:

No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1.	Pixel Value Ordering with Prediction Error Expansion Based High Fidelity Reversible Data Hiding Scheme	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://www.ripublication.com/ijaer.htm">https://www.ripublication.com/ijaer.htm</a>	<a href="https://dx.doi.org/10.37622/IJAER/14.4.2019.997-1005">https://dx.doi.org/10.37622/IJAER/14.4.2019.997-1005</a>	Yes
2.	Reversible Data Hiding Scheme using Prediction Error Expansion in Pixel Value Blocking and Ordering	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://www.ripublication.com/ijaer.htm">https://www.ripublication.com/ijaer.htm</a>	<a href="https://dx.doi.org/10.37622/IJAER/14.8.2019.2029-2037">https://dx.doi.org/10.37622/IJAER/14.8.2019.2029-2037</a>	Yes
3.	Adjacent Pixel Values Blocking and Prediction Error Expansion Based High	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://www.ripublication.com/ijaer.htm">https://www.ripublication.com/ijaer.htm</a>	<a href="https://dx.doi.org/10.37622/IJAER/14.11">https://dx.doi.org/10.37622/IJAER/14.11</a>	Yes

	Fidelity Reversible Data Hiding Scheme							<a href="#">.2019.2585-2595</a>	
4.	GNSS er tatya ebong khetra samikhai er proyog: ekti alochona	Dr. Deepa Bhattacharjee	Geography	Bhugol Swadesh Charcha (Print Only)	2020	2581-4788	<a href="https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList">https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList</a>	<a href="https://www.maheshtalacollege.ac.in/research-papers">https://www.maheshtalacollege.ac.in/research-papers</a>	Yes
5.	A generalized line segmentation method for multi-script handwritten text documents	Payel Rakshit	Computer Science	Expert Systems with Applications (Impact Factor: 7.5)	2022	0957-4174	<a href="https://www.sciencedirect.com/journal/expert-systems-with-applications">https://www.sciencedirect.com/journal/expert-systems-with-applications</a>	<a href="https://doi.org/10.1016/j.eswa.2022.118498">https://doi.org/10.1016/j.eswa.2022.118498</a>	Yes
6.	Comparative study on the performance of the state-of-the-art CNN models for handwritten Bangla character recognition	Payel Rakshit	Computer Science	Multimedia Tools and Applications (Impact Factor: 3.0)	2022	1380-7501	<a href="https://link.springer.com/journal/11042">https://link.springer.com/journal/11042</a>	<a href="https://doi.org/10.1007/s11042-022-13909-6">https://doi.org/10.1007/s11042-022-13909-6</a>	Yes
7.	An Ecoepidemic seasonally forced model for the combined effects of fear, additional foods and selective predation	Sasanka Shekhar Maity	Mathematics	Journal of Biological Systems	2022	0218-3390	<a href="https://www.worldscientific.com/worldscinet/jbs">https://www.worldscientific.com/worldscinet/jbs</a>	<a href="https://www.worldscientific.com/doi/10.1142/S0218339023500316">https://www.worldscientific.com/doi/10.1142/S0218339023500316</a>	Yes
8.	Optimization of time-dependent fuzzy multi-objective reliability redundancy allocation problem for n-stage series-parallel system	Satyajit De	Computer Science	Innovations in Systems and Software Engineering	2023	1614-5046	<a href="https://link.springer.com/journal/11334">https://link.springer.com/journal/11334</a>	<a href="https://doi.org/10.1007/s11334-023-00539-w">https://doi.org/10.1007/s11334-023-00539-w</a>	Yes
9.	Optimization of time based fuzzy multi-objective reliability redundancy allocation problem for xj-out-of-m system using tuning and neighborhood based fuzzy MOPSO algorithm	Satyajit De	Computer Science	Applied Soft Computing (Impact Factor: 7.2)	2023	1568-4946	<a href="https://www.sciencedirect.com/journal/applied-soft-computing">https://www.sciencedirect.com/journal/applied-soft-computing</a>	<a href="https://doi.org/10.1016/j.asoc.2023.110998">https://doi.org/10.1016/j.asoc.2023.110998</a>	Yes
10.	Document Image Skew Detection and Correction: A Survey	Barun Biswas	Computer Science	International Journal of Innovative Research in Technology	2023	2349-6002	<a href="https://ijirt.org/">https://ijirt.org/</a>	<a href="https://ijirt.org/master/publishedpaper/IJIRT158871_PAPER.pdf">https://ijirt.org/master/publishedpaper/IJIRT158871_PAPER.pdf</a>	Yes

11.	An Overview of Existing Literature on Document Skew Detection	Barun Biswas	Computer Science	Malaysian Journal of Computer Science	2023	0127-9084	<a href="https://ejournal.um.edu.my/index.php/MJCS">https://ejournal.um.edu.my/index.php/MJCS</a>	<a href="https://doi.org/10.22452/mjcs.vol136no4.5">https://doi.org/10.22452/mjcs.vol136no4.5</a>	Yes
12.	Landform and Land Use Characteristics in Leh Valley with special reference to Leh City and Adjacent Stakmo Fan Area	Dr. Deepa Bhattacharjee	Geography	Geographical Review of India	2023	0375-6386	<a href="https://geographicalsocietynodia.org.in/geographical-review-of-india/">https://geographicalsocietynodia.org.in/geographical-review-of-india/</a>	<a href="https://www.maheshtalacollege.ac.in/research-papers">https://www.maheshtalacollege.ac.in/research-papers</a>	Yes
13.	Optimization of time based fuzzy multi-objective reliability redundancy allocation problem for xj-out-of-m system using tuning and neighborhood based fuzzy MOPSO algorithm	Payel Rakshit	Computer Science	Applied Soft Computing (Impact Factor: 7.2)	2023	1568-4946	<a href="https://www.sciencedirect.com/journal/applied-soft-computing">https://www.sciencedirect.com/journal/applied-soft-computing</a>	<a href="https://doi.org/10.1016/j.asoc.2023.110998">https://doi.org/10.1016/j.asoc.2023.110998</a>	Yes
14.	Role of Space in an Eco-Epidemic Predator-Prey System With The Effect of Fear and Selective Predation	Sasanka Shekhar Maity	Mathematics	Journal of Biological Systems	2023	0218-3390	<a href="https://www.worldscientific.com/worldscinet/jbs">https://www.worldscientific.com/worldscinet/jbs</a>	<a href="https://www.worldscientific.com/doi/10.1142/S0218339023500316">https://www.worldscientific.com/doi/10.1142/S0218339023500316</a>	Yes
15.	Historical digit recognition using CNN: a study with English handwritten digits	Payel Rakshit	Computer Science	Sadhana (Impact Factor: 1.4)	2024	0973-7677	<a href="https://link.springer.com/journal/12046">https://link.springer.com/journal/12046</a>	<a href="https://doi.org/10.1007/s12046-023-02322-wSadh">https://doi.org/10.1007/s12046-023-02322-wSadh</a>	Yes
16.	Changes in Land Use and Land Degradation in a Tourism-Centric City, Uttarakhand: A Field-Based Discussion	Dr. Deepa Bhattacharjee	Geography	Bhugol Swadesh Charcha	2024	2581-4788	<a href="https://abcdindex.com/Journal/Bhugol-Swadesh-Charcha-(print-only)-2581-4788">https://abcdindex.com/Journal/Bhugol-Swadesh-Charcha-(print-only)-2581-4788</a>	NA	Yes
17.	Optimization of time-dependent MORRAP for series-parallel system using improved NSGA-II in interval environment	Satyajit De	Computer Science	Innovations in Systems and Software Engineering (Impact Factor: 1.1)	2024	1614-5054	<a href="https://link.springer.com/journal/11334">https://link.springer.com/journal/11334</a>	<a href="https://doi.org/10.1007/s11334-024-00588-9">https://doi.org/10.1007/s11334-024-00588-9</a>	Yes

# Publications in different reputed UGC care list Journals

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Expert Systems With Applications

journal homepage: [www.elsevier.com/locate/eswa](http://www.elsevier.com/locate/eswa)

## A generalized line segmentation method for multi-script handwritten text documents

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**ARTICLE INFO**

**Keywords:** Unconstrained handwriting; Light projection; Start point detection; Boundary tracking; Text line segmentation; Filling and smoothing

**ABSTRACT**

Handwritten document image segmentation into text-lines is a crucial stage towards unconstrained handwritten document recognition. In the context of Indian subcontinent various scripts are used for communication where a system for multi-script handwritten text line segmentation is very much essential. This paper presents a multi-script text line segmentation algorithm based on newly developed light projection, start point detection, and boundary tracking methods. The proposed approach is capable of overcoming most of the hindrance faced by state-of-the-art methods. The experiment is performed on our proposed Bangla handwritten document image dataset WBSUBNdB\_text and also on a variety of well-known public handwritten datasets namely: CMATERdb, PdbIndic\_11, KHATT, HIT-MW, ISI Bengali Writer Identification/Verification dataset, ICDAR 2013 segmentation contest dataset, ICDAR 2013 writer identification contest benchmark dataset, and obtained promising results.

**1. Introduction**

Text Line Segmentation is not only one of the most crucial pre-processing steps of OCR but also essential for tasks like the alignment of text/image, extraction of specific fields, word spotting (Jamuna & Haribabu, 2015), handwriting analysis (Halder et al., 2018; Mukherjee et al., 2019; Vishal & Agarwal, 2021), etc. Some of the systems follow analytic approach where the unit of recognition is character and for such systems line segmentation is an immensely important stage that needs to be followed. "Line" is a basic entity of text document image and segmentation of line is treated as one of the most significant tasks of handwritten OCR. Thus, it is very clear that line segmentation is an unavoidable step for document image processing. Text line segmentation of machine printed documents is quite a solved problem but the same task is still challenging for handwritten documents. The wide variations of handwritten text make the segmentation task more challenging. The major difficulties include high variation in writing styles, irregular line gap, skew angle between text lines, variable character size, and overlapping or touching lines. In different languages (e.g. Arabic, Greek, French, Bangla, Urdu, etc.), plethora of accents make their presence frequently, this intern incorporates more hurdles for line segmentation. To top it all, the irregular and diverse nature of handwritten documents are dependent on writers which increases the level of difficulty to a great extent. Many researchers have put their contribution to solve this problem of text line segmentation in freestyle environment (Likforman-Salem & Faure, 1994; Rakshit et al., 2018). There are already some conventional approaches like projection profile (Babarczyki & Pisk, 2020), Hough transform (Louloudis et al., 2009; Pu & Shi, 1999); Smearing and grouping of components etc. (Ganote et al., 2007; Shi & Govindaraju, 2004), but these methods become inadequate to handle all types of documents when they are applied individually. Sometimes the combination of some conventional methods show more effectiveness than an individual one which is quite evident in the literature (Rakshit et al., 2018; Sansam et al., 2020; Sarkar et al., 2009; Samatopoulos et al., 2013). In this work, an attempt has been made towards an efficient yet less complex line segmentation system capable of handling diverse handwritten documents. Distinguishing of foreground and background pixel or text and non text area is a very common step towards text line segmentation to make the task easier. In the proposed system, isolating the text and non-text regions of a document is done using a novel light projection method. It uses the properties of light where text components are considered as objects. Following the same properties, whenever light gets a text pixel as an obstacle in its path,

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## Comprehensive Analysis of Deterministic and Stochastic Eco-Epidemic Models Incorporating Fear, Refuge, Supplementary Resources, and Selective Predation Effects

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**Abstract**

In this investigation, we delve into the dynamics of an ecoepidemic model, considering the intertwined influences of fear, refuge-seeking behavior, and alternative food sources for predators with selective predation. We extend our model to incorporate the impact of fluctuating environmental noise on system dynamics. The deterministic model undergoes thorough scrutiny to ensure the positivity and boundedness of solutions, with equilibria derived and their stability properties meticulously examined. Furthermore, we explore the potential for Hopf bifurcation within the system dynamics. In the stochastic counterpart, we prioritize discussions on the existence of a globally positive solution. Through simulations, we unveil the stabilizing effect of the fear factor on susceptible prey reproduction, juxtaposed against the destabilizing roles of prey refuge behavior and disease prevalence intensity. Notably, when disease prevalence intensity is too low, the infection can be eradicated from the ecosystem. Our deterministic analysis reveals a complex interplay of factors: the system destabilizes initially but then stabilizes as the fear factor suppressing disease prevalence intensifies, or as predators exhibit a stronger preference for infected prey over susceptible ones, or as predators are provided with more alternative food sources. Moreover, for the stochastic system, the oscillations tend to cluster around the coexistence equilibrium of the corresponding deterministic model when white noise intensity is low. However, with increasing white noise intensity, oscillation amplitudes escalate. Critically, very high levels of white noise can lead to the eradication of infection from the ecosystem.

**Keywords** Eco-epidemic model · Fear effect · Prey refuge · Additional foods · Selectivity · Stochasticity

**1 Introduction**

Research scientists have extensively utilized mathematical models to explore epidemiological and ecological systems [1–6]. Various predator-prey models have been examined, focus-

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প্রথম সর্বভারতীয় বাংলা ভূগোল পত্রিকা

## ভূগোল স্বদেশ চর্চা

BHUGOL SWADESH CHARCHA

● 20th YEAR, 2nd Vol ● July-December 2024  
Registration Number : WBBEN / 2007 / 21524  
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● প্রতিষ্ঠা অনুপ্রেরণা ●  
|| অধ্যাপক সুভাষচন্দ্র বসু ||

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|| ড. শিশির চ্যাটার্জী ||

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● সূত্র ●  
|| প্রিন্ট আর্থ ||  
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উত্তরপাড়া, হুগলী

● কৃতজ্ঞতা ●  
অধ্যাপক কল্যাণ রায়, অধ্যাপক মলয় মুখোপাধ্যায়,  
অধ্যাপক সুনন্দ বন্দ্যোপাধ্যায়,  
ড. পারমিতা মজুমদার,  
ড. বিষ্ণুজিত বেরা, ড. সুমান ভট্টাচার্য

সুদীপ্যে

সম্পাদকীয়

আন্তর্জাতিক বস্তু, বস্তুত ক'রে বাঁচলে মোরে  
মলয় মুখোপাধ্যায় ২

পর্যটনকে কেন্দ্রীক ভূমি ব্যবহারের পরিবর্তন ও  
ভূমি অরনমনঃ যৌশীমত পুরন, উত্তরাঞ্চল—  
একটি ক্ষেত্র সমীক্ষাত্মিক আলোচনা  
দীপা ভট্টাচার্য ও রতনকুমার দত্ত ১৪

ক্ষুদ্র আন্দামান দ্বীপের অরণ্য প্রকল্পের  
পর্যায়ক্রম এবং তার ভৌগোলিক প্রভাবঃ  
একটি পরিবেশ নির্ভর মূল্যায়ন  
শাহজী রায় ২২

অর্থনৈতিক ভূগোলের প্রেক্ষিতে  
পশ্চিমবঙ্গে ন্যূনতম বেঙ্গল ছাগলের  
গতানুগতিক উৎপাদন পদ্ধতি থেকে  
বাণিজ্যিক উৎপাদনের প্রয়োজনীয়তা  
—একটি পর্যালোচনা  
বৈশাখী রায় ৩০

Innovations in Systems and Software Engineering  
<https://doi.org/10.1007/s11334-024-00588-9>

ORIGINAL ARTICLE

## Optimization of time-dependent MORRAP for series-parallel system using improved NSGA-II in interval environment

Satyajit De<sup>1</sup>

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**Abstract**

This research proposes a novel time-dependent interval-valued function-based multi-objective reliability redundancy allocation problem (TIVF-MORRAP) focused on multi-stage series-parallel systems. Time is a critical factor in assessing system reliability and cost. The novel contribution of this study is the use of an interval-valued function (IVF) approach to manage uncertainties in component reliability, cost, and repair costs, with time as a key variable. The objective is to boost system reliability and minimize costs over time by efficiently allocating redundant components at each stage. The process ensures a restricted allocation of duplicates across all stages and the entire system. In this problem the reduction in component reliability and cost are modeled by the varying radius length along the inverse logarithmic spiral over time. Likewise, the escalation in component repair costs is depicted by the logarithmic spiral. In this study, NSGA-II-AGDV is introduced, a multi-objective evolutionary algorithm (MOEA) that combines NSGA-II (Non-dominated Sorting Genetic Algorithm-II) with agglomerative and divisive clustering algorithms and the Topsis method to solve the problem. Unlike NSGA-II, which utilizes crowding distance, many researchers have adopted a single clustering technique to improve diversity and limit the solution set size. The proposed algorithm integrates two clustering techniques, enhancing functionality while also reducing execution time. A benchmark problem verifies the proposed method, showing enhanced performance and better convergence to true Pareto optimal solutions compared to NSGA-II and NSGA-II with crowding distance elimination (NSGA-II-CDE) across various time values.

**Keywords** Reliability redundancy allocation model · Spiral model · Interval-valued function · Non-dominated sorting · Agglomerative clustering · Divisive clustering

**1 Introduction**

In a multi-stage series-parallel reliability redundancy allocation Model (RRAM), improving reliability involves consistently allocating redundant components across each stage, using similar components when feasible, and optimizing resource use across stages [1]. This study utilizes a  $n$ -stage series-parallel framework, following the model proposed by De et al. [2]. Within this setup, each of the  $n$  stages is connected in series, with the  $i$ <sup>th</sup> stage containing  $x_i$  components in parallel, where  $1 \leq x_i \leq E$ . For these components, one serves as the primary, while the others ( $x_i - 1$ ) serve as redundant backups, with  $E$  denoting the maximum permissible components per stage.

To address the outlined model, TIVF-MORRAP is introduced. The primary aims of this problem are to maximize system reliability while minimizing both system cost and system repair costs. The problem is constrained by a limit on the allowable number of components per stage, as well as the total number of components across the entire system. The main goal of this research aims to optimize the placement of redundant components at every stage, ensuring that the stated objectives are met while adhering to the specified constraints on time. To enhance realism and flexibility in TIVF-MORRAP, uncertainties in component reliability and costs are managed through the utilization of IVF, as suggested by Roy et al. [3]. Time plays a crucial role in assessing the system's reliability and cost. Typically, component reliability and cost tend to decrease, while component repair costs increase by a certain factor relative to their previous

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