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**Academic Year 2022-23**

Sr. No.	Name of the Teacher	Title of the book/chapters published	Title of the paper	Department	Evidences
1	Prof K.P. Sable	-	Online Examination Proctoring System Using Artificial Intelligence	Computer Science and Engineering	Click Here
2	P.R.Bharambe Dr.S.R.Paraskar Dr.S.S.Jadhao	-	A Novel algorithm for discrimination of the magnetizing inrush current and internal fault current of a transformer using Teager Energy Operator and Artificial Neural Network	Electrical Engineering	Click Here
3	R.S.Kankale Dr.S.R.Paraskar Dr.S.S.Jadhao	-	Development of wavelet and ANN based algorithm in labview environment for classifying the power quality disturbances.	Electrical Engineering	
4	Dr.A.U.Jawadekar	-	Enhancing performance of hybrid electric vehicle using optimized energy management methodology	Electrical Engineering	
5	Dr.S.R.Paraskar	-	Review on control Technique of DC-DC Cuk Converter for Various Application	Electrical Engineering	
6	R.S.Kankale Dr.S.R.Paraskar Dr.S.S.Jadhao	-	Classification of power quality disturbances using the unique combination of Hilbert transform image processing and K nearest neighbor	Electrical Engineering	
7	Mukesh Chavan Dr. A.U.Jawadekar	-	PCA and ANN Based Induction Motor Fault Classification	Electrical Engineering	
8	Mr. B.S.Rakhonde Dr. Chetan Khadase	Nature Inspired Algorithm for Optimization and Engineering Design	Open CV and MQTT Based Intelligent Traffic Management System	Electrical Engineering	
9	M.N.Tibdewal	-	Comparison of different denoising networks on motion Artifacts MRI scans.	Electronics and Telecommunication Engineering	



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 Website- [www.ssgmce.ac.in](http://www.ssgmce.ac.in)

10	Swapnil P. Badar; Kamalesh Khanchandani	-	Successive Cancellation Polar Decoder Implementation using Processing Elements	Electronics and Telecommunication Engineering	Click Here
11	Swapnil P. Badar; Kamalesh Khanchandani	-	Fast Polar Decoder Implementation using Special Nodes	Electronics and Telecommunication Engineering	
12	Mrs. K. S. Vyas / Ms. A. A. Deshmukh	-	A Survey paper on Blockchain Technology and Consensus Algorithms	Electronics and Telecommunication Engineering	
13	M.N.Tibdewal	-	Design and Implementation of Smart Water Level Indicator and Valve Controller	Electronics and Telecommunication Engineering	
14	Dr.D.D.Nawgaje	-	Smart Multilevel Car Parking System	Electronics and Telecommunication Engineering	
15	Dr.D.D.Nawgaje	-	Application of Deep learning algorithm in detection of Diabetic Retinopathy	Electronics and Telecommunication Engineering	
16	Kamlesh Kahar	-	Micro Scale Energy Scavengers for low power applications in Rural Areas	Electronics and Telecommunication Engineering	
17	Kamlesh Kahar	-	Vehicle safety system for blind spot and Hilly areas	Electronics and Telecommunication Engineering	Click Here
18	Dr. Amitkumar Manekar	-	Comparative Analysis of Nature-Inspired Meta-Heuristic Optimization Algorithm	Information Technology	
19	Dr. Amitkumar Manekar	-	Survey Of Particle Swarm Algorithm To Optimize Energy In Modern Data Centers	Information Technology	
20	Dr. Amitkumar Manekar	-	Machine Learning Based Expense Tracker Application For Personal Finance Management	Information Technology	
21	Dr. Amitkumar Manekar	-	Optimizing Diabetic Retinopathy Detection in Type-2 Diabetes Patients.	Information Technology	



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22	Prof.M.B. Bhambere	-	Comparative review on conventional and recently developed perforated fins for heat transfer enhancement	Mechanical Engineering	Click Here
23	Prof K.V.Chandan, Prof N.G.More	-	A Solar Tracking Feasibility Study for Developments in Solar Tracking System	Mechanical Engineering	
24	Vaishnavi Sahu Dr. S. M. Mishra	-	Impact Of Stress On Employees Behavior In Organization	Master of Business Administration	Click Here
25	Dr. B T Husain & Dr. M. A. Dande	Educational Reforms in the Modern World- Volume 2	Effective Innovative Academia And Industry Partnerships To Promote Higher Education With A Special Focus On Management Institutes In India	Master of Business Administration	



  
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is authored by

Divya Agrawal, Kalyani Sable, Radhika Maloo, Shachi Chaware, Suved Bhagwat, Tanishq Nanda

in the **IEEE National Students' Conference on Innovation In Rural Development** organized  
by IEEE Students' Branch, Shri Sant Gajanan Maharaj College of Engineering, Shegaon  
held on 20th - 21st April 2023.

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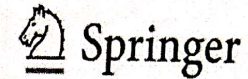
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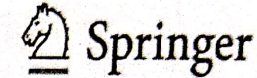
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**PROUDLY PRESENTED TO**

**Ravishankar Shaligram Kankale**

**For presenting the technical paper entitled**

**"Development of Wavelet and ANN based Algorithm in LabVIEW Environment for  
Classifying the Power Quality Disturbances"**

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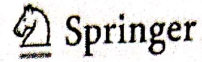
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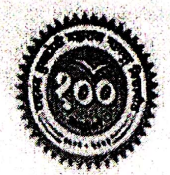
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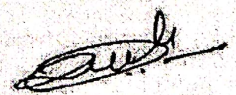


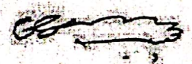
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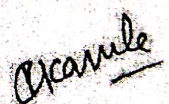


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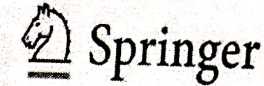


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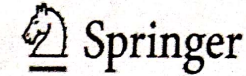
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8:28 AM

Gmail - Fwd: CFC: Nature-Inspired Algorithms for Optimization and Engineering Design

 Gmail

Bhushan Rakhonde <bhushan.rakhonde@gmail.com>

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**Fwd: CFC: Nature-Inspired Algorithms for Optimization and Engineering Design**

1 message

Fri, Mar 24, 2023 at 8:30 PM

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Chetan Khadse <chetan.khadse@mitwpu.edu.in>  
To: bhushan.rakhonde@gmail.com

Please see below

----- Forwarded message -----

From: Apoorva Shastri <apoorva.shastri@mitwpu.edu.in>  
Date: Thu, Nov 24, 2022, 11:15 AM  
Subject: Re: CFC: Nature-Inspired Algorithms for Optimization and Engineering Design  
To: Chetan Khadse <chetan.khadse@mitwpu.edu.in>

Dear Author(s)

I am pleased to inform you that your manuscript entitled '**OpenCV and MQTT based Intelligent Traffic Management System**' is accepted for publication in the '**Nature-Inspired Algorithms for Optimization and Engineering Design**' book, planned to be published in Springer.

Please refer to the reviews attached to this email and revise your manuscript accordingly. Please send the editable version of the revised manuscript in reply to this email by December 5, 2022. Also note that the overall similarity of the chapter should not exceed 25% with single source similarity no more than 5%.

**Note: Clearly show the revisions in the text by highlighting the changes with blue color.**

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Thank you.  
Apoorva

On Fri, Nov 4, 2022 at 2:36 PM Apoorva Shastri <apoorva.shastri@mitwpu.edu.in> wrote:  
Received, thank you Dr Khadse

On Fri, Nov 4, 2022, 1:32 PM Chetan Khadse <chetan.khadse@mitwpu.edu.in> wrote:  
Dear Madam,

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Please find the attached copy of the manuscript for the Book you proposed.

Kindly consider it for the review.

Thanks and Regards

On Fri, Nov 4, 2022 at 12:27 PM Apoorva Shastri <apoorva.shastri@mitwpu.edu.in> wrote:  
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--

Apoorva S Shastri

Research Assistant Professor

Institute of Artificial Intelligence

MIT World Peace University

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# OpenCV and MQTT based Intelligent Traffic Management System

Anand Mahajan, Satej Gadekar, Sumit Sagave, Smita Paithankar, Bhushan Rakhonde\*, Chetan Khadse

MIT World Peace University, Pune \* SSGMCE, Shegaon

Email: [anandmahajan222@gmail.com](mailto:anandmahajan222@gmail.com), [satejgadekar@gmail.com](mailto:satejgadekar@gmail.com), [sumitsagave17@gmail.com](mailto:sumitsagave17@gmail.com), [smita.paithankar@mitwpu.edu.in](mailto:smita.paithankar@mitwpu.edu.in), [bsr.ssgmce@gmail.com](mailto:bsr.ssgmce@gmail.com), [chetan.khadse@mitwpu.edu.in](mailto:chetan.khadse@mitwpu.edu.in)

**Abstract**—In this paper, a system is proposed which is intelligent and can perform identification, counting, and calculation of density of vehicles. After calculating the traffic density, the system classifies it into low, medium, and high density with the help of a decision algorithm. This system is based on python programming, and the libraries used in Python are Open- source Computer Vision, NumPy, chardet, and time library. The system is implemented in IoT-based platform Message Queuing Telemetry Transport. The system methodology is carried out in four phases. In the first phase, vehicle detection and counting are done. In the second phase, the number plate of the vehicle is detected as well as displayed. The third phase includes traffic density detection and finding out the emergency vehicle based on GPS Tracking using ESP32 and IoT over MQTT. The fourth phase is related to pollution monitoring. This complete model for the system is made, and the results are shown in the paper.

**LIBRARIES used:** chardet, NumPy, OpenCV-python, pip, time, Wi-Fi, PubSubClient, SoftwareSerial, TinyGPS++.

**Index Terms**—LIBRARIES used: chardet, NumPy, OpenCVpython, pip, time, WiFi, PubSubClient, SoftwareSerial, TinyGPS++

## I. INTRODUCTION

The smart traffic management system is a centralized system that works collectively with sensors and makes traffic congestion easy for everyday travelers. Many countries have poor traffic handling and management. The conventional traffic signal needs to be upgraded with the latest technology to mitigate the increasing number of vehicles on roads. The installation of smart traffic management systems has created a unique way to detect speed violating vehicles. However, many of the existing methods of vehicle detection have a scope of improvement. Camera input is required to teach the system to identify the car. The automatic number plate detection system uses Image subtraction, character segmentation, and further analysis as a founding base for vehicle tracking [1]. OpenCV framework is used to capture and process each frame per second and accordingly used for further analysis. While detecting and counting the number of cars, a threshold line must be set as a reference line for the system. This line is drawn at an optimum level to count the vehicles only after crossing the line [2], [3].

Vehicles are the most common things causing the ever-increasing pollution on this planet. Therefore, it is crucial to track the increase in pollution daily and use the data to reduce pollution in every possible way [4], [5]. Hence, the last phase in this paper is to collect the pollution data using the MQ135 gas sensor, one of the most common sensors used to detect gases such as CO<sub>2</sub>, Smoke, NH<sub>3</sub>, NO<sub>x</sub>, Alcohol, Benzene, etc [6], [7].

In this paper, two methods have been discussed to detect the arrival of emergency vehicles.

In the first method, as soon as the vehicle comes near the traffic signal, the driver can indicate its arrival using an android application by connecting with the Bluetooth receiver situated in the traffic signal. Then, an android application is used to change the traffic signal. Thus, a simple android application is used to indicate the arrival of the emergency vehicle. However, due to the limited range of Bluetooth zone, a more feasible method is to keep track of the emergency vehicle.

The second method requires low-power sensors, a microcontroller, and a robust IoT platform. In this case, a NodeMCU ESP32, a popular Wi-Fi-based microcontroller, is used. The vehicle's location is continuously tracked using the GPS module. The real-time location is sent to the MQTT server, which further sends the information of the arriving vehicle to the receiver at traffic signals. The operator can then remotely change the traffic signal and allow easy access to the emergency vehicle [8], [9].

## II. METHODOLOGY

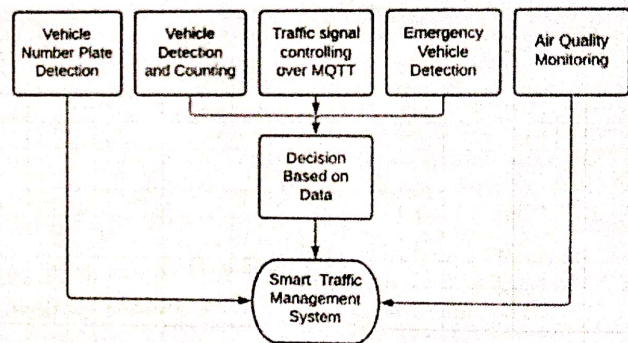


Fig. 1. Block diagram for the smart traffic management system

The above diagram represents the entire operation of a smart traffic signal which comprises four phases. The first phase is vehicle number plate detection. The second phase is vehicle detection and counting, which is further used to determine the density of vehicles in each lane [10].

The third phase is the detection and smooth passage of an emergency vehicle. The traffic signal is controlled remotely without the need for the emergency vehicle to stop in the traffic. The fourth phase monitors the pollution in the air and displays the amount in parts per million (ppm) on the dashboard. Combining the data obtained from all the above phases further helps in monitoring the traffic efficiently and intelligently.

### A. Phase I and Phase II working:

Firstly, the vehicle tracking, and counting are done using OpenCV. The input required is given using dedicated cameras



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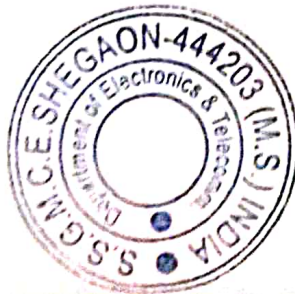
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3.3.3: Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during year

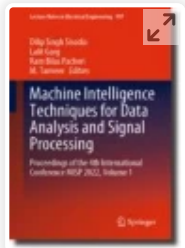
Year: 2022-23

Sr. No.	Name of the teacher	Title of the paper	Name of the conference
1	Dr.M.N.Tibdewal	Comparison of different denoising networks on motion Artifacted MRI scans.	International Springer Conference on Machine Vision and Signal Processing, MISP-2022
2	Mr.Swapnil P. Badar; Dr.Kamlesh Khanchandani	Successive Cancellation Polar Decoder Implementation using Processing Elements	IEEE Region 10 Symposium (TENSYMP)
3	Mr.Swapnil P. Badar; Dr.Kamlesh Khanchandani	Fast Polar Decoder Implementation using Special Nodes	2nd International Conference on Paradigm Shifts in Communications Embedded Systems, Machine Learning and Signal Processing (PCEMS)
4	Mrs. K. S. Vyas , Ms. A. A. Deshmukh	A Survey paper on Blockchain Technology and Consensus Algorithms	11th International Conference on Emerging Trends in Engineering & Technology - Signal and Information Processing
5	Dr.M.N.Tibdewal	Design and Implementation of Smart Water Level Indicator and Valve Controller	IEEE National Students' Conference on Innovation in Rural Development
6	Dr.D.D.Nawgaje	Smart Multilevel Car Parking System	Electronics & Computer Exigencies-ETECE-2023
7	Dr.D.D.Nawgaje	Application of Deep learning algorithm in detection of Diabetic Retinopathy	IETE International Conference on AI & ML DRIVING 5G & BEYOND
8	Mr.Kamlesh Kahar	Micro Scale Energy Scavengers for low power applications in Rural Areas	IEEE National Students' Conference on Innovation in Rural Development
9	Mr.Kamlesh Kahar	Vehicle safety system for blind spot and Hilly areas	IEEE National Students' Conference on Innovation in Rural Development

Mrs. K. S. Vyas / Mr. V. S. Ingole  
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Dr. M. N. Tibdewal  
HoD, EXTC



## **Machine Intelligence Techniques for Data Analysis and Signal Processing** pp 301–314

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# Comparison of Different Denoising Networks on Motion Artifacts MRI Scans

[Vijay Tripathi](#) , [Manish Tibdewal](#) & [Ravi Mishra](#)

Conference paper | [First Online: 31 May 2023](#)

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## Abstract

Any kind of patient movement during an MRI scan can lead to blurry MRI scans. The defects introduced due to patient movement are called motion artifacts. Voluntary movements can be largely eliminated, but the same is not possible for involuntary movements. Breathing and the beating of the heart cause

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# Successive Cancellation Polar Decoder Implementation using Processing Elements

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### Abstract



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- II. Polar Code
- III. Successive Cancellation Polar Decoder
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- V. Conclusion

**Abstract:**Channel coding is key factor of error free communication. Polar code is selected as channel control code for 5G wireless system in third generation partnership project Ne... [View more](#)

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##### Abstract:

Channel coding is key factor of error free communication. Polar code is selected as channel control code for 5G wireless system in third generation partnership project New Radio – 3GPP NR. Polar code has ability to use all channel capacity as contrast with low density parity check (LDPC) and turbo code. Successive cancellation (SC) decoder is basic polar code decoder which works sequentially. Due to sequential in nature of SC decoder, latency is high. SC polar decoder using processing element like f-function node, g-function node and partial sum function node is designed in this paper. The connections of these processing elements are followed to polar code decoding circuit graph. SC polar decoder is designed by two ways, the first is without component code and other is with component code (structural way). Processing elements and SC polar decoder VLSI architectures generated by Xilinx platform are shown in this paper.

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# Successive Cancellation Polar Decoder Implementation using Processing Elements

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**Abstract**—Channel coding is key factor of error free communication. Polar code is selected as channel control code for 5G wireless system in third generation partnership project New Radio - 3GPP NR. Polar code has ability to use all channel capacity as contrast with low density parity check (LDPC) and turbo code. Successive cancellation (SC) decoder is basic polar code decoder which works sequentially. Due to sequential in nature of SC decoder, latency is high. SC polar decoder using processing element like  $f$ -function node,  $g$ -function node and partial sum function node is designed in this paper. The connections of these processing elements are followed to polar code decoding circuit graph. SC polar decoder is designed by two ways, the first is without component code and other is with component code (structural way). Processing elements and SC polar decoder VLSI architectures generated by Xilinx platform are shown in this paper.

**Keywords**— Polar code, SC decoder, channel coding, wireless communication, 5G.

## I. INTRODUCTION

Error correcting code (ECC) has an importance for error free communication. Proper design of encoder and decoder makes communication noiseless as according to Shannon's theorem [1]. Transmitter sends the  $N$ -bits, which has  $K$ -input bits and  $(N - K)$  additional coding bits. In case of polar code these  $(N - K)$  bits are frozen bits. Transmitter and receiver know frozen bits sequence. At receiver end, information bits can be regenerated with an error probability in the limit of large  $N$  and coding rate  $R = \frac{K}{N} < C$ . Channel capacity  $C$  is given in equation (1).

$$C = \max_{p(x)} I(X; Y) \quad (1)$$

$I(X; Y)$  is mutual information between input and output and it is maximized  $\max_{p(x)}$  over all probability distribution  $p(x)$  for the channel input. To design ECC for utilizing maximum channel capacity is one of the challenging task for 5G communication system. ECC like Turbo codes [2] and LDPC Codes [3] [4] [5] achieved channel capacity for practical purposes but not maximum. These ECC codes are used in various wireless applications such as high-speed packet access (HSPA), long-term evolution (LTE), worldwide interoperability for microwave access (WiMAX) and Wi-Fi etc. Arikan [6] introduced polar codes first time in 2009. This polar code achieved maximum channel capacity as it is proved. Encoder and decoder for polar code can be easily design as it has low complexity algorithm as compare to other ECC.

In 3GPP Meeting 2016, LDPC code was selected for the data channels as it has better decoding latency; throughput

for large block length as well as it supports multiple code rates. LDPC code is replaced with the turbo code for 5G NR [7]. In the same 3GPP meeting, the polar code was selected for control channel as it has best error correction capability for short block length. Polar code is replaced with tail-biting convolution codes (TBCC) of LTE [8].

Polar code achieves shannon's channel capacity for any binary input discrete memory less channel (B-DMC)  $W$ [6]. Channel polarization is the base of polar code. Polar code creates  $N$  synthetic channels, which would be less or noisier channel. The polar code is sequential in nature. Let  $W$  as BMS channel which has input alphabet  $X \{0,1\}$  and output alphabet  $Y$ . The transition probability is  $\{W(y|x): x \in X, y \in Y\}$ . To measure the reliability of channel  $W$ , Bhattacharya parameter ( $Z(W) \in [0,1]$ ) is used. The definition of Bhattacharya parameter is defined in [6] as:

$$Z(W) = \sum_{y \in Y} \sqrt{W(y|0)W(y|1)} \quad (2)$$

For good bit channels, the Bhattacharya parameter is low and high for worst bit channels.

In this paper, polar encoder and decoder is described in detail. SC polar decoder is implemented using processing elements such as  $f$ -function node,  $g$ -function node and partial sum node. The implementation of SC polar decoder is done for  $P(8,5)$  decoding circuit graph. Also SC polar decoder is designed with constitute code and without constitute code. Constitute code of 4-bit and 2-bit has been synthesized and simulated on Xilinx platform, which used to design 8-bit polar decoder.

This paper is organized as follows: polar code encoder is described in Section II. The formulation of code using codeword is presented in this section. The binary code tree and the encoder circuit graph representation using codeword are defined. Section III has SC polar decoder concept and architecture. SC decoding approach based on decoding binary tree and graph circuit is explained. The processing elements such as  $f$ -function node,  $g$ -function node and partial sum with their equivalent equations are mentioned in this section. SC polar decoder design is proposed in section IV. SC polar decoder is designed by two ways. First is by using processing elements and second is by using component code. Synthesis and simulation result of proposed design and comparative analysis with existing SC decoder design is given in section V.

## II. POLAR CODE

Channel polarization divides the  $N$ -bits input vector  $u$  of polar code  $P(N, K)$  into message bit (reliable  $K$ ) channels





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# Fast Polar Decoder Implementation using Special Nodes

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##### Abstract:

The information sent by the transmitter to the receiver through the channel may be user information or control information. For error-free communication, errorcorrecting codes are needed to detect and correct errors. ECCs like low-density parity check (LDPC) and polar code are selected for channel data and channel control coding, respectively, for 5G wireless communication. Compared to LDPC and turbo codes, Polar code has the ability to use all channel capacity. The Successive Cancellation decoder is a basic polar decoder, which has longer latency due to its sequential nature. A polar decoder with special nodes is proposed in this paper. This fast polar decoder makes the decoding operation faster. The polar decoder is designed using special nodes–Rate-zero, Rate-one, Single Parity Check, and Repetition nodes. These special nodes are generated from the proposed node generator circuit. VLSI architectures of special nodes and fast polar decoder are generated by the Xilinx platform, which is shown in this paper

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# Fast Polar Decoder Implementation using Special Nodes

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**Abstract**—The information sent by the transmitter to the receiver through the channel may be user information or control information. For error-free communication, error-correcting codes are needed to detect and correct errors. ECCs like low-density parity check (LDPC) and polar code are selected for channel data and channel control coding, respectively, for 5G wireless communication. Compared to LDPC and turbo codes, Polar code has the ability to use all channel capacity. The Successive Cancellation decoder is a basic polar decoder, which has longer latency due to its sequential nature. A polar decoder with special nodes is proposed in this paper. This fast polar decoder makes the decoding operation faster. The polar decoder is designed using special nodes – Rate-zero, Rate-one, Single Parity Check, and Repetition nodes. These special nodes are generated from the proposed node generator circuit. VLSI architectures of special nodes and fast polar decoder are generated by the Xilinx platform, which is shown in this paper

**Keywords**— Error correcting codes, polar code, SC decoder, channel coding, wireless communication.

## I. INTRODUCTION

The transmitter, channel, and receiver are the basic building blocks of a communication system. Due to channel fading and noise interference, the receiver may not receive the correct information, resulting in transmission errors. Error-correcting codes (ECC) play an important role in detecting and correcting transmission errors in a communication system. For channel coding in noiseless communication, the encoder's design at the transmitter side and the decoder's design at the receiver side should be appropriate as per Shannon's theorem [1]. In 5G communication, designing ECC is one of the most challenging tasks to utilize the maximum channel capacity. Polar codes have achieved maximum channel capacity compared to Turbo codes [2] and LDPC codes [3][4][5]. Polar code was introduced by Ariken [6]. Since polar code has simple algorithms compared to other ECCs, polar encoders and decoders can be designed easily.

Let the transmitter send  $N$  bits, of which  $K$  bits are input bits and  $(N - K)$  bits are supplementary coding bits in polar code. The additional  $(N - K)$  bits are frozen bits, and the transmitter and receiver both know the sequences of frozen bits. The information bits can be recovered with an error probability in the limit of large  $N$  and coding rate  $R = K/N < C$ . The channel capacity  $C$  is given by equation (1), where the mutual information  $I(X; Y)$  between input and output is maximized over all probability distributions  $p(x)$  for the channel input:

$$C = \max_{p(x)} I(X; Y) \quad (1)$$

In the 3GPP Meeting 2016, LDPC and Polar codes were selected for data channels and control channels, respectively. However, for 5G NR, LDPC codes have been replaced with Turbo codes as they offer better decoding latency and throughput for large block lengths. Additionally, LDPC codes support multiple codes [7]. Polar codes have taken the place of tail-biting convolution codes (TBCC) of LTE because they offer the best error correction capability for short block lengths [8].

The basis of Polar codes is channel polarization, where the channel is virtually divided into  $N$  synthetic channels. These  $N$  channels are either the worst or the best, depending on the Bhattacharya parameter [6]. The reliability of channel  $W$  can be measured using the Bhattacharya parameter  $Z(W) \in [0,1]$ , which is defined as follows:

$$Z(W) = \sum_{y \in Y} \sqrt{W(y|0)W(y|1)} \quad (2)$$

Here,  $W$  is a Binary Symmetric Channel (BSC) with an input alphabet  $X \{0,1\}$  and output alphabet  $Y$ .  $\{W(y/x): x \in X, y \in Y\}$  represents the transition probability of the channel. Good bit channels have the lowest Bhattacharya parameter, while the worst bit channels have the highest Bhattacharya parameter

This paper provides a detailed description of polar codes and their basic decoding approach. The processing elements required to design any polar decoder are discussed in detail. The decoding flow of the Successive Cancellation (SC) decoder is explained with a schematic. Based on the bit patterns given in the binary tree, special nodes are identified to implement a fast polar decoding approach. These special nodes are generated with the help of a node generator circuit. The fast polar decoder circuit is implemented using these special nodes. The proposed decoder is designed using Verilog HDL and synthesized on the Xilinx platform.

This paper is organized as follows: Section II provides an introduction to polar code formulation. Section III presents the polar decoding approach using a decoding binary tree. Section IV describes the special nodes - Rate-zero, Rate-one, Single Parity Check (SPC), and Repetition (Rep) - and proposes a fast polar decoding approach using these special nodes. Section V presents the simulation and synthesis results of the polar decoder with special nodes and provides a comparison with the current SC decoder design.



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**Swapnil P. Badar, Kamlesh Khanchandani and Pravin Wankhede**

in the 2<sup>nd</sup> **International Conference on The Paradigm Shifts in Communication, Embedded Systems, Machine Learning and Signal Processing (PCEMS 2023)** organized by **Visvesvaraya National Institute of Technology, Nagpur, India**, held during 5<sup>th</sup> – 6<sup>th</sup> April 2023.

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##### Abstract:

Blockchain is a decentralized technology. It is a public, immutable append only ledger. The data can be verified by all the participants which makes the system transparent and secured. This paper provides information about history of blockchain, various cryptographic primitives including digital signature and public key cryptography, which are used in blockchain and different consensus algorithms. The consensus algorithms used in blockchain is a focus in this paper. Particularly we studied about consensus algorithms like proof of work, proof of stake, delegated proof of stake, proof of burn, proof of capacity, proof of activity, proof of elapsed time, byzantine fault tolerance, delegated byzantine fault tolerance, seieve and directed acrylic graph from various points of views like security, scalability, power consumption, fault tolerance, throughput, speed, node identity management, application platform etc. We also tabulated the comparison of various consensus algorithms.

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# Design and Implementation of Smart Water Level Indicator and Valve Controller

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**Keywords:** Water level sensor, ATmega328p, ESP8266, Solenoid Valve

## Abstract

Abstract— Accurate and reliable water level monitoring and control are crucial for efficient water management. This research paper presents the design and implementation of a smart water level indicator that utilizes the BC547 transistor-based inductive level measurement technique for discrete level measurement. The system includes an ATmega328p microcontroller that processes the data and controls the different inputs and output lines, such as LEDs and an online interface for remote monitoring and control of water levels. The system uses the inductive properties of water to detect water levels at four different levels. The online interface displays real-time water levels and allows the user to control the solenoid valve to manage water levels. The smart water level indicator provides an efficient and user-friendly solution to water level management, helping to minimize water wastage and promote sustainable water usage. The results of testing demonstrate the accuracy and reliability of the system in monitoring and controlling water levels.

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# Design and Implementation of Smart Water Level Indicator and Valve Controller

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**Abstract**— Accurate and reliable water level monitoring and control are crucial for efficient water management. This research paper presents the design and implementation of a smart water level indicator that utilizes the BC547 transistor-based inductive level measurement technique for discrete level measurement. The system includes an ATmega328p microcontroller that processes the data and controls the different inputs and output lines, such as LEDs and an online interface for remote monitoring and control of water levels. The system uses the inductive properties of water to detect water levels at four different levels. The online interface displays real-time water levels and allows the user to control the solenoid valve to manage water levels. The smart water level indicator provides an efficient and user-friendly solution to water level management, helping to minimize water wastage and promote sustainable water usage. The results of testing demonstrate the accuracy and reliability of the system in monitoring and controlling water levels.

**Keywords**—Water level sensor, ATmega328p, ESP8266, Solenoid Valve.

## I. INTRODUCTION

In a broad range of situations, including industrial and domestic applications, such as fuel storage, flood warning, and water level control in homes, accurate, moderately priced, and dependable equipment for detecting liquid levels is crucial. Conventional liquid level sensors use electromechanical methods, which raise safety issues in areas where explosives are present. Point level measurement sensors and continuous level sensors are the two primary types of level measurement control sensors utilised in industries.[1]–[3] Continuous level sensors monitor fluid level across a wide range as opposed to at a single spot, unlike point level measurement sensors. Different level measurement devices have been developed, including mechanical, capacitive, inductive, ultrasonic, acoustic, or optical methods. While mechanical and ultrasonic[4] methods are primarily used for measuring the

level of solid materials in the form of dust, capacitive and optical methods are better suited for detecting fluid levels.[5]–[8]

The main focus on designing and implementing a smart water level indicator using the discrete water level indication technique with an NPN bipolar transistor-based sensor, specifically the BC547 transistor. This technology works on the conductive properties of water, making it an affordable and reliable option for liquid level measurement. Our system includes an ATmega328p microcontroller connected to the BC547 transistor for processing data, with different inputs and output lines such as an LCD display and a buzzer for providing real-time information to the user.[9], [10] We also incorporate an ESP8266 Wi-Fi module that provides a connection to a website interface, allowing the user to interact with the system remotely. [11]The website interface displays real-time water levels and allows the user to control the solenoid valve to manage water levels.

The significance of the smart water level indicator in industrial processes cannot be overstated. It is a crucial component that plays a vital role. Water scarcity is a significant problem that affects many areas worldwide, and improper management and control of water resources often contribute to the lack of access to clean water. Our project aims to provide an efficient and user-friendly solution to water level management, which helps to minimize water wastage and promote sustainable water usage.

## II. SPECIALTY OF TRANSISTOR:

Transistors are electronic devices that have a wide range of applications in modern electronics. They are used for amplification or switching of electrical signals, making them an essential component in many circuits. One type of transistor is the NPN bipolar junction transistor (BJT) BC547, which has three terminals: emitter, base, and collector. In this project,





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of Shri, Sant Gajanan Maharaj college of Engineering, Shegaon.

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& secured the ..... position. We wish him / her the grand success for his/her future endeavors.

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## Micro Scale Energy Scavengers for Low Power Applications in Rural Areas

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**Keywords:** Energy Scavenging, Piezoelectric, MEMS, Ecofriendly, Generation, Energy.

### Abstract

The country like India where majority of the population still lives in rural area, energy crisis is the issue which needs to be resolved at earliest. This paper discusses about the various techniques of energy scavenging in rural areas. Two smart methods of energy scavenging for low power applications are discussed in detail which includes MEMS based energy scavenger using piezoelectric effect and other method includes pedal power generation using exercise cycle. Output of 5.5V was generated using Piezoelectric Scavenger arranged in cantilever geometry and voltage around 5V was generated using pedal power generator. The proposed methods are eco-friendly, simple and will definitely help in solving the energy crisis issues.

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# Micro Scale Energy Scavengers for Low Power Applications in Rural Areas

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**Keywords**— Energy Scavenging, Piezoelectric, MEMS, Eco-friendly, Generation, Energy.

## I. INTRODUCTION

According to a survey done by the World Bank in 2020, the world will face serious energy scarcity issues by 2030 [1] which will definitely lead to serious downfall of the human race. To prevent such difficult events the world needs to implement methods to generate energy which must be green, clean and eco-friendly. Energy should be widely available in emerging nations like India since it is one of the fundamental necessities for maintaining our civilization [2]. India where majority population lives in rural areas currently, 2.9 billion people still cook with harmful and inefficient fuels, while 1.2 billion people in the Least Developed Countries (LDCs) lack access to electricity [3]. Most developing nations now rely on fossil fuels like coal and natural gas to meet their energy demands, and as countries' energy consumption rises, so do their carbon emissions[4]. 60% of all greenhouse gas (GHG) emissions are caused by energy use [5]. Nearly a quarter of all global CO<sub>2</sub> emissions are produced by the energy industry for power systems[6]. Many times, due to lack of resources the most of the energy generated by conventional methods is utilized in urban development. Hence, we need to find solutions to harvest energy in remote locations from the resources available there. In this paper two smart methods of renewable energy generation are discussed including MEMS-

based energy generation and dynamo-based energy generation. These two methods are very efficient for low power and point of care applications in remote and rural locations. Broadly there are two popular methods of energy generation depending upon the resources available: non-renewable and renewable energy sources.

## II. NON-RENEWABLE ENERGY RESOURCES

Globally, non-renewable energy dominates the energy consumption profile[7]. Traditional non-renewable energy generation methods include the use of fossil fuels such as coal, oil, and natural gas to generate electricity as shown in fig.1. These energy production techniques have been used extensively for many years and are still crucial sources of power around the world, but they also have negative environmental effects and are not thought to be sustainable in the long run, the reasons we will understand one by one.

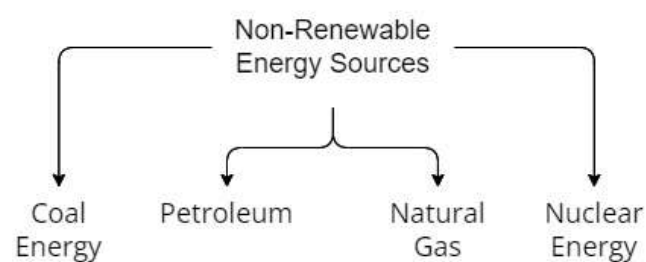


Fig.1. Classification of Non-Renewable energy Sources

Due to its accessibility and low cost, coal-based energy generation is widely employed, but it also significantly contributes to air pollution, greenhouse gas emissions, and poses threats to the environment and public health [8]. Similar issues arise when using petroleum-based energy sources, and the extensive usage of these sources can cause unstable economies owing to rising oil costs. Natural gas-based energy production is thought to be more efficient and cleaner, however fracking techniques can be harmful to the environment and water supplies, and natural gas resources are limited, making it less sustainable. Nuclear energy production



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## Vehicle Safety system for Blind Spot and Hilly Areas

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**Keywords:** Road Traffic, Blind Spot, Sensor, Microcontroller

### Abstract

A blind spot for a car, also known as a vehicle blind spot, is a space around the car that, when the driver is behind the wheel, cannot be seen clearly. The maximum distance a driver of a vehicle can see and recognise conspicuous items around the vehicle is known as driver visibility in the transportation industry. Vision is mostly influenced by the environment (see visibility) and the construction of a vehicle. The dashboard, pillars, and windscreen are among the car's components that affect visibility. Safe road traffic requires drivers to have good visibility. This is a project which has been crafted as an actual prototype that detects vehicles from a sufficient distance and alerts other vehicles on the other opposite side with the help of LED indicator boards and LiDAR sensors. This prototype is most useful at sharp turns and "T" turns which turns out most accidental areas. This project has been sponsored by a road safety Non-government Organization namely TRAX NGO. Which works on various stages related to road safety all over India. This is a innovational project is one of its type made till date and will be first ever such prototype to be installed and implemented on road. This project is under process of permissions to be implemented on road under one of road safety incharge at Nagpur city.

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# Vehicle Safety system for Blind Spot and Hilly Areas

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**Keywords**— Road Traffic., Blind Spot, Sensor, Microcontroller.

## I. INTRODUCTION

Street car crashes and passing's brought about by them are most basic issues now a days. It is additionally affecting tentation's economy. A blind spot for a car, also known as a vehicle blind spot, is a space around the car that, when the driver is behind the wheel, cannot be seen clearly. The maximum distance a driver of a vehicle can see and recognise conspicuous items around the vehicle is known as driver visibility in the transportation industry. Vision is mostly influenced by the environment (see visibility) and the construction of a vehicle. The dashboard, pillars, and

windscreen are among the car's components that affect visibility. Safe road traffic requires drivers to have good visibility. The areas that are too low to see behind, in front of, or to the sides of a vehicle, particularly those with a high seating point, are also commonly referred to as blind spots. Measures taken to slow the rate of accidents include roadway planning, street lights, and compensation for damaged automobiles.

Fig. 1 describes the driver's restricted view in a horizontal plane. This can lead to front-end blind spots, which can be problematic in congested areas like roundabouts, intersections, and road crossings. Several design factors have an impact on front-end blind spots:

- The pillar's thickness, angle on a vertical plane, and distance between the driver and it are all factors.
- The pillar's inclination in a front perspective of a vertical plane.
- The pillar angle of the in a vertical plane side view
- The pillar angle of the in a vertical plane front view
- The windshield's angle, the driver's height in relation to the dashboard
- The shape of the pillar (straight or arc-shaped), and the speed of the vehicle in front of you



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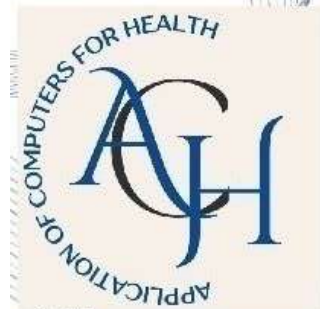
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# Comparative review on conventional and recently developed perforated fins for heat transfer enhancement

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Sharad S. Chaudhari, Madhao B. Bhambere and Punit Fulzele



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# Comparative Review On Conventional And Recently Developed Perforated Fins For Heat Transfer Enhancement

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**Abstract.** Innovative design of perforated and non-perforated fin is a prime importance of thermal system to enhance the rate of heat transfer. The traditional and innovative designs of fins used in different applications such as IC engines, heat exchangers, electronics heat sinks, electric motors, etc. The main aim of this article is to present a comprehensive review on the comparative thermal performance analysis between solid and perforated fins. Also focused on heat transfer analysis of different types of fins with various designs and dimensions, also studied free and forced convection heat transfer with correlations of dimensionless numbers. Researchers emphasized that the rate of heat transfer of perforated fins is greater than the conventional fins. The review concluded with recommendations that recently developed perforated fins are the best choice than solid fins for enhancing the heat transfer rate of thermal systems. Also the concept of perforated fins can be applied to an electric motor/machine in order to enhance the heat transfer rate and ultimately its life and efficiency.

**Keywords:** Perforated fins designs, Fins performance, Heat transfer enhancement, Forced convection

## INTRODUCTION

Fins (Extended surfaces) enhance the rate of heat transfer from a surface by increasing surface area to convection. Generally, fins are made up of material, whose thermal conductivity is high such as Aluminium, Copper, etc. Different types of fins including rectangular fins, pin fins are widely used in various industrial applications such as in heat exchangers, heat sinks, gas turbine blades, evaporators and condensers, electronics components, electric motors, and transformers. Overheating of thermal systems is a major issue in industries; it is desired to keep the minimum temperature of various components of thermal systems, fins are played a vital role here, so accurate optimized fins design is necessary to fulfill the requirement of thermal systems for its better performance. Many researchers have taken efforts to enhance the thermal performance of (Non-perforated and Perforated) fins using experimentation or simulations with the aid of powerful computational tools and advanced techniques. The collection of these efforts and major findings are presented here. This paper, reviewed the research work of almost last two decades on designs, developments and thermal analysis of non-perforated and perforated fins. Initially, mentioned the work in which, studied the fins or fin arrays designs and developments in solid (non-perforated) fins to achieve the better thermal performance, including a study of fins shapes (rectangular or pin fins), sizes, thickness, pitches, number of fins, the position of fins (straight or inclined), in-depth study of flow around the fins, natural or forced convection analysis and then on the same line detailed analysis of perforated fins are presented. The main focus is given on a comparison between the thermal performances of solid (non-perforated) and perforated fins.

One of the earliest studies of pin fins array, it was used for increasing the rate of heat transfer through airfoil-shaped turbine blade at narrow trailing edge side. It was observed that the heat transfer coefficient becomes doubled because of the presence of fins as compared to no fins [1]. Fins and fins array also widely used in free convection in

method. The parameter such as fin pitch ratio, fin dimensions, and fan cover position concerning the fin examined to achieve reducing the average temperature of winding. A result showed that fin pitch ratio has a greater influence on the variation of temperature of winding and optimized proposed design shows a reduction in the rise of winding temperature by 4.8°C.

### **Thermal performance of solid fins in non-specified application area**

C. B. Sobhan et al. [2] studied experimentally convective heat transfer through fins and arrays of a fin, calculated the local values of heat flux, heat transfer coefficient, temperature, local, and overall Nu number. Also generated correlations between Nu (Nusselt) number and Ra (Rayleigh) number for a single fin based on height and for a horizontal array, based on the spacing. The highest fin efficiency could achieve at maximum heat flux per unit length at base. Ugur Akoyal and Kadir bilen [8] investigated experimentally the enhancement of heat transfer through hollow rectangular profile fins with various Reynolds numbers for two arrangements, inline and staggered. In the staggered arrangement, flow turbulence increases, and proper mixing of fluid takes place, so a little bit better heat transfer rate has been observed as compared to the inline arrangements. B. Yazicioglu et al. [10] optimized the fin spacing by investigating experimentally natural convective heat transfer analysis of rectangular fins attached to the vertical base. It has been observed that, as the height of fin increases, the rate of heat transfer also increases and optimum fin spacing depends on fin height and length and base to ambient temperature difference. The optimum value of spacing ranges between 10.4 mm to 11.9 mm for this specific case. Qiu-Wang Wang et al. [12] carried out computational heat transfer and pressure drop analysis of finned tubes having wavy fins. Three sets of fins are analyzed, i.e. plain fins, sinusoidal wavy fins, and interrupted wavy fins, comparatively wavy fins give a better heat transfer rate than plain fins, but more pressure drop. Out of the above three cases, the sinusoidal wavy fins have the best performance. This paper [15] analyzed analytically the five cases of heat transfer through Bi-convection fins. The result shows that the rate of heat transfer is higher than the conventional fins as Bi-convection fins having effective thermal conductivity, fin indices, cross-sectional area, and the increase in the temperature difference between the base and free stream. Biswaranjan Pati et al. [44] investigated numerically the thermal performance of cylindrical and conical pin fin arrays of staggered and inline, at a low value of Reynold's number. A better heat transfer enhancement has been observed in the staggered arrangement because much larger eddies formation leads to more turbulence in fluid flow as compared to the inline arrangement.

### **RECENT DEVELOPMENTS IN PERFORATED FINS FOR THE ENHANCEMENT OF HEAT TRANSFER**

Concept of perforated fins used in the various industries or different applications for enhancement of heat transfer from the thermal systems from the last decades. Perforated fins mean the preparation of different shapes and sizes holes on the non-perforated fin for increment in the rate of heat transfer.

#### **Thermal performance of perforated fins in motorcycle engine (IC Engines)**

Bibhuti B Sahoo et al. [68] investigated numerically the cooling performance of an air-cooled engine of two-wheelers with varying fins geometries. Modeling, simulation and analysis have done by using Solid-works, Mechanical ANSYS and Fluent respectively. In thermal analysis, the temperature variation has been observed along the length of original and modified fin. Results reveals that, perforation made on the fins of engine, rises in air flow along with increase in surface area, this also one of the reason for increasing the rate of heat transfer of IC engines. Mayank Gupta et al. [48] focused on the heat transfer analysis of a two-wheeler single cylinder engine with perforated fins using ANSYS 15. Different simulations for varying perforation sizes i.e. 2mm, 4mm, and 6mm, with different materials (Gray cast Iron, structural steel, and Al) have been carried out, and the result shows, the rate of heat transfer increases by increasing the size of perforation. The best performance has obtained in Gray Cast Iron engine having 6mm size of perforation.

of thermal systems. A review includes a parametric study of fins such as fin lengths, width, height, pitch, spacing, number of fins, and innovative designs such as wavy, zigzag, porous, slotted, interrupted, compounded, cross fins, etc. to achieve better thermal performance from it. Many researchers have investigated the heat transfer analysis through perforated fins of various shapes and size perforations and compared the performance of perforated and solid fins. As per the researcher's findings, it can be concluded that with the following points:

- Reduction in temperature is observed by increasing the fin height or reducing fin pitch, but more fins with a small value of fin pitch results increase in temperature instead of decreasing because of resistance to flow in between the fins.
- Fin arrays in staggered arrangement give better heat transfer rate, because of turbulence in the flow, more interaction with a solid surface of fluids takes place as compared to the inline arrangement.
- New designs of fins such as wavy fins, zigzag fins, slotted fins, knurled surface fins, etc. give on average approximately 15% to 20% enhancement in heat transfer as compared to the conventional solid fins.
- Nusselt no., Reynolds no., Prandtl no. and flow velocity around the thermal systems play an important role in heat transfer analysis through fins. Also various computational tools such as ANSYS CFD, FLUENT, FEM, Taguchi method, CATIA, etc. widely used for analyzing the thermal performance of thermal systems having fins through simulation and optimization.
- From comparative analysis between solid and perforated fins, it can be concluded that the rate of heat transfer in case of solid fins decreases due to the formation of stagnation layer on its surface, whereas in perforated fins, movement of fluid flow (turbulence) increases due to perforation, so significant enhancement in heat transfer is observed also weight of a perforated body of fins reduces, ultimately saving the material and cost. With the use of perforated fins, increment in heat transfer has been observed in the range of (approx.) 10% to 30%. So perforated fins can be a good replacement for solid (non-perforated) fins.

The above literature indicates that in early years from year 2001 to 2010, a design and development was done in solid or non-perforated fins and applied in many thermal systems. Later on in last decades (2011-2021), a focused was given on perforated fins and observed significant enhancement in heat transfer rate in various thermal systems such as IC engines, heat exchangers, electronics components etc. However the heat transfer enhancement using innovative design of perforated fins of electric motors is not well studied and as per the author's opinion the experimental work on this topic is very limited in the open literature. So more work need to be done in this topic. To avoid the overheating and to increase the life and efficiency of an electric motors, there is need to check the suitability of newly designed perforated fins to electric motors as per as heat transfer enhancement is concerned.

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**Proceedings of  
Annual International Conference  
on**

# **Enhancing Productivity in Hybrid Mode : The Beginning of a New Era**

*Edited by*

**Dr. Amol Gawande  
Dr. Atul Kumar**





## IMPACT OF STRESS ON EMPLOYEES BEHAVIOR IN ORGANIZATION

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### **Abstract:**

*The impacts of work stress on people and the economy have been extensively documented in the literature. The purpose of this study is to investigate the relationship between managers' occupational identities, high-performance management techniques, and burnout. In the stress and human resource management research, we suggest a theoretical framework incorporating identity theory. We look into the claim that low levels of manager identity verification will be linked to higher levels of burnout and that high-performance human resource management practices (HPRMPs) will function as a moderator of this association. The causes and methods that stress can lead to unwanted behavior will all be covered in this abstract as it relates to how stress influences employee behavior in workplaces. Managers can take steps to decrease the negative behavioral impacts of tension on employees. The increased (global) competitiveness, growing resource restrictions on organizations for employee programs and services, and management reluctance to such initiatives were all factors that this expert panel projected would lead to even more workplace stress.. Many beneficial ideas were generated. The study employed a quantitative approach by posing questions to 100 organization employees and a qualitative approach by conducting semi-structured interviews with 100 employees from various organizations in various industries.*

**Keywords:** Performance, Disengagement, Stress Management, Human Resources, Efficiency.

### **BACKGROUND OF THE STUDY**

Employees experience a variety of pressures at work today, which can have an effect on their productivity and general well-being. There is a growing body of literature that demonstrates the detrimental impacts of stress on employee outcomes like job performance, job happiness, and organizational commitment.

The transactional model of stress developed by Lazarus and Folkman in 1984 contends that an individual's reaction to stress is impacted by both their perception of the stressor and their coping mechanisms. According to the paradigm, people who perceive the stressor as a threat and do not have enough coping mechanisms to handle the stress may have unfavorable effects as a result of stress. There are several

definitions of stress in the literature, and there is considerable debate over the nomenclature of which term should be used to denote different characteristics of stress (Thatcher & Miller, 2003). Three are identified by Buunk, De Jonge, Ybema, and De Wolff (1998:148). Stress has become a more common occurrence in today's society and is an unavoidable part of modern life. According to Narayanan et al. (1999), workplace stress could actually be linked to nearly any feature of a job or work environment, including extremes of heat, noise, and light, as well as too much or too little responsibility. Irene (2005) defines job stress as a pattern of reactions that happen when workers are given work expectations that are not compatible with their knowledge, skills, or talents and that test their capacity for adjustment.

According to research (Spector & Fox, 2005), stress can cause a variety of unfavorable employee behaviors, such as absenteeism, turnover, and workplace deviance. For instance, stressed-out workers may be more prone to miss work, be less focused on their jobs, and exhibit unproductive habits like stealing from their employers or slandering coworkers.

#### **LITERATURE REVIEW:-**

- a) High levels of stress have been regularly linked to decreased productivity and performance at work, according to research. For instance, Huang and colleagues' (2016) study indicated that among workers in the hotel business, workplace stress was inversely correlated with job performance. In a similar vein, Halbesleben and Buckley's (2004) meta-analysis discovered a strong inverse association between occupational stress and job performance across a variety of industries.
- b) Employee disengagement, which is characterized by feelings of alienation and a lack of motivation for work, can also be caused by stress. Employees who are disengaged are less likely to contribute to the organization and could even deliberately undermine its objectives. In a sample of Turkish managers, Yildirim and Aycan's (2008) study discovered a positive relationship between job stress and employee disengagement.
- c) Jamal's (2010) research looked at the connection between call centre workers' stress levels and productivity. The study discovered a negative link between job stress and job performance, with job satisfaction serving as a partial mediating factor.
- d) Kim and colleagues (2013) looked examined the effect of workplace stress on employee creativity in a sample of South Korean workers in a different study. According to the study, employee weariness served as a partial mediator in the association between high levels of stress and employee creativity.
- e) Additionally, research has demonstrated that stress's effects on employee behavior might differ based on human traits including personality and coping mechanisms. According to a study by Schwarzer and Hallum (2008), for instance, people with high levels of self-efficacy were better able to handle stress on the job. They had greater levels of job satisfaction and performance.

#### **OBJECTIVE OF STUDY:-**

1. To examine the connection between staff stress and poor performance.
2. To investigate how stress influences workplace disengagement.

3. To understand how stress affects employees' ability to function on the job.
4. To determine the elements that operates as a brake on the interaction between stress and worker behavior.
5. To determine whether stress management techniques are successful in reducing unproductive employee behavior.

**RESEARCH METHODOLOGY**

This study at the organization uses a quantitative approach. In this study, which used a saturated sample methodology, the population and sample were all organization personnel from different industries. 101 people responded to the questionnaire, however only 100 of them were able to be further evaluated. The major technique of data collection for this study was a questionnaire, and each response was given a Likert score.

**Table no.1: Measurement scale, operational definition, items, and variables**

No.	Variables	Operational definition	Item
1.	<b>Low efficiency</b>	Low efficiency of employees in an organization refers to a measurable decrease in the rate or quality of output, task completion, or productivity of individual employees or teams within the organization, as compared to an established benchmark or standard of performance.	<ol style="list-style-type: none"> <li>a. Employees do not receive adequate support from their managers, colleagues, or organization, they may feel isolated by stress.</li> <li>b. Employees do not have the resources they need to manage their workload.</li> <li>c. Employees struggle to balance their work and personal lives.</li> <li>d. Employees are not sure what is expected of them or how they will be evaluated.</li> <li>e. Employees who do not feel recognized or appreciated for their hard work may experience stress.</li> </ol>
2.	<b>Disengagement</b>	Disengagement of employees in an organization refers to the extent to which employees feel disconnected from their work and the overall mission of the organization. Disengagement can manifest in a variety of ways, such as decreased productivity, absenteeism, lack of motivation, and lack of	<ol style="list-style-type: none"> <li>a. Employees are given an excessive amount of work, they may become over-stressed.</li> <li>b. Employees feel that they don't have the necessary support to manage their workload.</li> <li>c. Communication breakdowns can contribute to stress and</li> </ol>

		commitment to the organization's goals.	<p>disengagement in the workplace.</p> <p>d. Employees who feel that they are not being given opportunities to grow and develop their skills may become disengaged.</p> <p>e. Employees who feel that they are not being compensated fairly for their work may become disengaged.</p>
3.	<b>Job performance</b>	Stress can negatively affect an employee's job performance by reducing their ability to focus, think critically, and make sound decisions.	<p>a. High workloads, tight deadlines, and excessive pressure to perform can lead to stress.</p> <p>b. An unpleasant work environment, such as a noisy or chaotic workplace.</p> <p>c. Poor interpersonal relationships can lead to stress which can affect job performance.</p> <p>d. Jobs that require high levels of cognitive, emotional, or physical demands can lead to stress.</p> <p>e. An organizational culture that does not support employee well-being or overwork can contribute to stress</p>

- a. The table lists three variables together with their operational definitions, measuring instruments, and scales. Low efficiency is the first factor, which is defined as a quantifiable decline in the output rate or quality, task completion rate, or productivity of certain people or teams within the organization. Low efficiency is measured by factors including inadequate assistance, a lack of resources, difficulties juggling work and family obligations, imprecise expectations, and a lack of gratitude or recognition.
- b. The second factor is disengagement, which measures how alienated employees are from their jobs and the organization's overarching goals. There are several ways it might show up, including decreasing productivity, absenteeism, a lack of desire, and a lack of dedication to the objectives of the company. Excessive workload, a lack of essential support, poor communication, a lack of growth possibilities, and unfair compensation are among the factors used to gauge disengagement.

c. The third factor is job performance, which relates to how stress can impair a worker's capacity for concentration, critical thought, and sound judgment. High workload and pressure, an unpleasant work environment, bad interpersonal interactions, a high level of cognitive, emotional, or physical demands, a lack of support for employee well-being, and a lack of career development possibilities are all factors used to evaluate job performance.

**ANALYTICAL STATISTICS**

**1. Low efficiency**

H0= Employee behavior in the workplace is not significantly impacted by stress, and any observed productivity changes result from chance.

H1= Employee behavior in the workplace is significantly impacted by stress, and variances in efficiency are not random occurrences.

**Table no.2**

Low efficiency						
Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
WLB>Workload >low efficiency	100	4.0303	1.0046	-1.9541	0.0261	H0 - Rejected <b>H1 – Accepted</b>
Working hours>Workload >Low efficiency	100	1.4455	1.2023	2.0688	0.0200	H0 - Rejected <b>H1 - Accepted</b>
Workload>Low productivity	100	0.7082	0.8415	-1.5998	0.0556	H0 - Rejected <b>H1 – Accepted</b>

*Source: Calculated by Author*

**2. Disengagement:**

H0 = Stress and employee disengagement in an organization do not significantly correlate.

H1 = Stress and employee disengagement in an organization have a substantial relationship.

**Table no.3**

Disengagement						
Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
Disengagement >performance >output measures	100	1.0501	1.0247	-7.1103	0.0000	H0 - Rejected <b>H1 – Accepted</b>

Disengagement >Workplace behavior	100	0.8125	0.9014	-9.1740	0.0000	H0 - Rejected <b>H1 - Accepted</b>
Stress>Behavi or> Disengagement t	100	1.1277	1.0619	-2.8717	0.0023	H0 - Rejected <b>H1 - Accepted</b>

Source: Calculated by Author

### 3. Job performance

H0 = Job performance and stress levels among personnel in the company do not significantly correlate.

H1 = Job performance and stress levels among employees in the company have a substantial relationship.

Table no.4

Job Performance						
Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
Productivity>J ob performance	100	0.7146	0.8453	-1.7313	0.0425	H0 - Rejete d <b>H1 – Accept ed</b>
Workload>Beh avior>Job performance	100	0.8125	0.9014	-2.344	0.0100	H0 - Rejete d <b>H1 - Accept ed</b>
Communicatio n>Performance feedback	100	1.0480	1.0237	-2.1955	0.0146	H0 - Rejete d <b>H1 – Accept ed</b>

Source: Calculated by Author

## FINDING & DISCUSSION

### ➤ Low Efficiency:

According to the study findings, a supportive work environment, long workdays, stress, and a high workload all considerably lower productivity. Workload, however, does not significantly correlate with low productivity. To increase worker productivity,

employers should concentrate on fostering a positive workplace culture and dealing with issues like stress and workload.

Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
Working hours>Workload>Low efficiency	100	1.4455	1.2023	2.0688	0.0200	H0 - Rejected H1 - Accepted

➤ **Disengagement:**

In addition, the null hypothesis is rejected in both situations for stress and micromanagement, which are both important contributors to disengagement. The findings suggest that disengagement is a serious problem that can have an impact on a variety of areas of the workplace, including performance, behavior, and experience. Disengagement also seems to be influenced by stress and micromanagement.

Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
Stress>Behavior > Disengagement	100	1.1277	1.0619	-2.8717	0.0023	H0 - Rejected H1 - Accepted

➤ **Job Performance:**

In particular, a heavy workload and poor workplace conduct are linked to poor job performance, whereas good communication and connections with coworkers are linked to good job performance. The findings also imply that stress may have a detrimental effect on work performance, underscoring the significance of stress management in the workplace.

Variables	Original Sample (O)	Sample Average (M)	Standard Deviation (STDEV)	t-statistic	P Value	Description
Workload>Behavior>Job performance	100	0.8125	0.9014	-2.3446	0.0100	H0 - Rejected H1 - Accepted

**CONCLUSION:-**

The study's findings highlight the significance of developing a friendly workplace culture and supportive work environment to boost performance and productivity while decreasing disengagement. While a heavy workload by itself might not have a

substantial influence on productivity, it can be detrimental when paired with additional elements like stress or a toxic work environment. Workplace disengagement is recognized as a serious problem that is influenced by both stress and micromanagement. Strong relationships with coworkers and effective communication are emphasized as being crucial for job performance.

**✚ SCOPE FOR FURTHER RESEARCH :-**

- The extremely small sample size for the study was 100 corporate employees. Due to the limited sample size and potential underrepresentation of the diverse range of employees across the various organizations, the results may not be generalizable.
- Self-reporting bias: A questionnaire was utilized to gather the data, and the respondents provided their own information. Response bias is more likely to occur because respondents may not provide correct or true information as a result of social desirability bias or personal perceptions.

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Edited Book

# Educational Reforms in the Modern World

Volume 2



**Editors:**

Dr. M. Subha | Dr. J. Parameswari  
Dr Yathrib Ajaj | Dr. V. Vijayalakshmi  
Ms. Amita Bhati

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## CHAPTER 6

**EFFECTIVE INNOVATIVE ACADEMIA AND INDUSTRY PARTNERSHIPS TO PROMOTE HIGHER EDUCATION WITH A SPECIAL FOCUS ON MANAGEMENT INSTITUTES IN INDIA****Prof. Bilal Tafazzul Husain**

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**INTRODUCTION**

Innovative partnerships between education institutes and industry have become increasingly important in the field of management education in India. These partnerships are collaborative efforts between government bodies, private organizations, and academic institutions aimed at promoting effective management education in the country. By combining the resources and expertise of various stakeholders, innovative partnerships in management education can help address some of the key challenges facing the sector, such as a shortage of skilled professionals, a lack of industry-academia collaboration, and the need to promote entrepreneurship and innovation. In this context, innovative partnerships can take many forms, including collaborations to establish new management institutes, joint research projects, specialized training programs, and competitions that promote entrepreneurship and innovation. This chapter explores some examples of academia and industry partnerships in management education in India and their impact on the sector. It also sets out guidelines to set up an effective partnership between education institutes and industry.

**1. Indian Institute of Management (IIM) Bangalore and the Karnataka government innovative partnership:**

One example of an innovative public-private partnership for a management institute in India is the collaboration between the Indian Institute of Management (IIM) Bangalore and the Karnataka government. The partnership aims to establish the "Bengaluru Innovation and Entrepreneurship Centre" (BIERC), which will provide a platform for startups, entrepreneurs, and investors to collaborate and promote innovation and entrepreneurship in the region.

The partnership includes the provision of funding, infrastructure, and resources from the Karnataka government, while IIM Bangalore will provide the academic and research expertise necessary to support the center's activities. The center will provide incubation facilities, training programs, and mentoring support to startups and entrepreneurs, with a focus on promoting innovation and entrepreneurship in areas such as healthcare, education, and sustainability.

This innovative public-private partnership is an excellent example of how partnerships can be used to promote innovation and entrepreneurship in higher education. By bringing together the expertise of academia and the resources of the government, the partnership can provide a comprehensive

platform for startups and entrepreneurs to access the resources and support they need to succeed. Furthermore, by focusing on areas such as healthcare, education, and sustainability, the partnership can contribute to the development of innovative solutions to some of the most pressing challenges facing society today.

## **2. Collaboration between the Indian Institute of Management Ahmedabad (IIMA) and the Confederation of Indian Industry (CII):**

Another example of an innovative public-private partnership in the field of management education in India is the collaboration between the Indian Institute of Management Ahmedabad (IIMA) and the Confederation of Indian Industry (CII). The partnership aims to establish the CII-IIMA Centre of Excellence in Competitiveness for SMEs, which will focus on research and training related to small and medium-sized enterprises (SMEs). The partnership includes the provision of funding and resources from the CII, while IIMA will provide the academic and research expertise necessary to support the center's activities. The center will focus on developing case studies, training programs, and research on the competitiveness of SMEs in India, with a particular focus on emerging sectors such as renewable energy, healthcare, and e-commerce. This innovative partnership is an excellent example of how public-private partnerships can be used to promote research and training in critical sectors of the economy. By focusing on SMEs, the partnership can help promote innovation and growth in one of the most critical sectors of the Indian economy. Furthermore, by targeting emerging sectors such as renewable energy and e-commerce, the partnership can help promote the development of cutting-edge solutions to some of the most pressing challenges facing society today.

## **3. Collaboration between the Xavier School of Management (XLRI) and the Tata Trusts:**

Another example of an innovative academia and industry partnership in management education in India is the collaboration between the Xavier School of Management (XLRI) and the Tata Trusts. The partnership aims to establish the Tata Social Enterprise Challenge (TSEC), which is a national competition for social entrepreneurship. The partnership includes the provision of funding and resources from Tata Trusts, while XLRI will provide the academic and administrative expertise necessary to support the competition. TSEC aims to encourage the creation of sustainable, scalable, and innovative social enterprises that can address some of India's most pressing social challenges. The competition is open to all Indian citizens, and participants are invited to submit innovative ideas that can address social challenges such as health, education, and environment, among others. Winners of the competition receive seed funding, mentorship, and networking opportunities, and are also given access to a range of other resources, including training, legal support, and marketing assistance. This innovative partnership is an excellent example of how partnerships can be used to promote social entrepreneurship in India. By bringing together the expertise of XLRI and the resources of Tata Trusts, the partnership can provide comprehensive support to social entrepreneurs who are trying to address some of India's most pressing social challenges. Furthermore, by providing seed funding, mentorship, and networking opportunities, the partnership can help promote the growth and sustainability of social enterprises in India.

## **4. Collaboration between the Indian School of Business (ISB) and the Goldman Sachs Foundation:**

This partnership aims to promote entrepreneurship and economic development in India by providing training and mentorship to women entrepreneurs. The partnership includes the provision of funding from the Goldman Sachs Foundation to establish the Women Entrepreneurs Programme (WEP) at the ISB. WEP is a six-month program that provides training, mentorship, and networking

opportunities to women entrepreneurs in India. The program is designed to help women entrepreneurs develop the skills and knowledge necessary to launch and grow successful businesses. WEP participants receive training in various areas of business management, including marketing, finance, operations, and leadership. They also receive one-on-one mentorship from experienced entrepreneurs and business leaders and have the opportunity to network with other entrepreneurs and potential investors. By providing comprehensive support to women entrepreneurs, the partnership can help address some of the key challenges facing women entrepreneurs in India, such as a lack of access to training, funding, and networking opportunities. Moreover, by promoting entrepreneurship and economic development, the partnership can contribute to the overall growth and development of the Indian economy

### **Conclusion:**

In conclusion, innovative partnerships between education institutes and industry players can play a significant role in promoting effective higher education in management in India. By combining the resources and expertise of various stakeholders, partnerships can help address key challenges such as the shortage of skilled professionals, the need for industry-academia collaboration, and the promotion of entrepreneurship and innovation. To leverage innovative partnerships effectively, management colleges should follow some essential guidelines. Firstly, they should identify the specific areas of collaboration based on their strengths and the needs of the industry. Secondly, they should establish a clear framework for collaboration and ensure that all stakeholders are aware of their roles and responsibilities. Thirdly, they should establish clear metrics to measure the impact of the partnership on student learning and industry outcomes. Fourthly, they should create an open and collaborative environment that encourages participation and exchange of ideas. Finally, they should prioritize the sustainability of the partnership by developing a long-term plan and creating mechanisms for continuous improvement.

To summarise, following steps are involved in establishing an effective academia and industry partnership:

1. Identify the objectives of the partnership and the stakeholders involved.
2. Determine the resources and expertise required to achieve the objectives.
3. Assess the strengths and weaknesses of potential partners.
4. Develop a clear framework for collaboration that outlines roles, responsibilities, and expectations.
5. Establish a communication plan and a system for regular reporting and feedback.
6. Define the financial and legal aspects of the partnership, including funding, intellectual property rights, and dispute resolution mechanisms.
7. Develop metrics for measuring the impact of the partnership on student learning and industry outcomes.
8. Establish a governance structure that ensures accountability, transparency, and sustainability.
9. Monitor the partnership's progress regularly and make adjustments as necessary to ensure its effectiveness.
10. Celebrate successes and learn from challenges to continuously improve the partnership.

By following these guidelines, management colleges can create effective partnerships that provide quality education, promote innovation, and contribute to the overall development of the management education sector in India. Innovative partnerships in management education can help bridge the gap between academia and industry, promote the development of skilled professionals, and contribute to the growth of the economy