



### 3.3.2

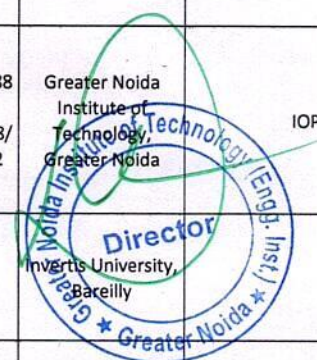
**List of Books/Chapters including Cover Page, Content Page, First Page of the Publications with Weblink (2020)**

**Greater Noida Institute of Technology (Engg. Institute)**

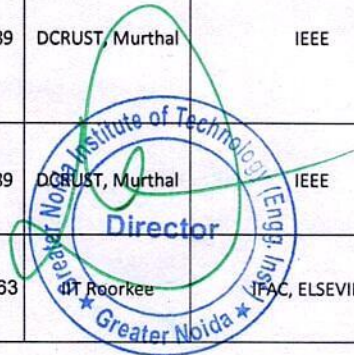
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3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/ International conference proceedings per teacher during last 5 years [2022, 2021, 2020, 2019, 2018]

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceeding	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Mr. Shiv Narain Gupta		Arduino Uno Based Time Glove Machine	4th National	4th National	Conference (National)	2020	978-93-86238-95-5	Greater Noida Institute of Technology	Excellent Publication House
2	Mr. Priyesh Tiwari		Arduino Uno Based Time Glove Machine	4th National	4th National	Conference (National)	2020	978-93-86238-95-5	Greater Noida Institute of Technology	Excellent Publication House
3	Dr. Rakhi Bhardwaj		Reliability Analysis of Wireless Link for IOT Applications Under Shadow-Fading Conditions	International Conference	International Conference	Conference (International)	2020	10.1016/j.procs.2020.03.362	Greater Noida Institute of Technology, Greater Noida	Elsevier
4	Dr. Anil Kumar Dubey	National e-Conference on Recent Advances in Science & Technology	Wide-band Patch Antenna Design and Optimization	S & T E-HACKTHON-2020	S & T E-HACKTHON-2020	Conference (National)	2020	S & T E-HACKTHON-2020	Greater Noida Institute of Technology, Greater Noida	Uttaranchal College Of Science and Technology, Nagal Hatnala, Dehradun, Uttarakhand
5	Dr. Shelly Garg		Analytic And Simulative Modeling Of Rof System With Intensity Modulation Including Fiber Dispersion Effect	4th International Conference	4th International Conference	Conference (International)	2020		Greater Noida Institute of Technology, Greater Noida	Institute of Electrical and Electronics Engineers(IEEE)
6	Mr. G.S.Bhati		Optimization of process parameters of A-359 in EPS assisted investment casting process, using Taguchi method.	ISFT-2020	ISFT-2020	Conference (International)	2020		JCBUST, YMCA	
7	Ms. Uma Tomer		Regression analysis of Covid-19 using machine learning algorithms	International Conference	International Conference	Conference (International)	2020		ADGITM, New Delhi	ICOSEC-2020
8	Ms. Uma Tomer		A comprehensive decomposition towards the facets of quality in IOT	International Conference	International Conference	Conference (International)	2020		ADGITM, New Delhi	ICOSEC-2020
9	Dr B S Chauhan	Inorganic Chemistry -I				national	2020	9.7894E+12	GNIOT	Vikash Publication House
10	Dr B S Chauhan	Inorganic Chemistry -II				national	2020	9.7894E+12	GNIOT	Vikash Publication House
11	Horesh Kumar	Artificial Intelligence and Cloud Computing Basics				international	2020	978-3-96492-257-1	GNIOT	Rubicon Publication
12	Horesh Kumar	A Computational Perspective of plant disease				international	2020	978-1-913482-60-2	GNIOT	weser Books
13	Mr. Kapil Kumar	SYSTEM AND METHOD FOR TRANSLATING A SOURCE SPEECH	Optimization of FDM 3D printing process parameters using Taguchi Technique	CEME 2020, IOP Conf	CEME 2020	International	2020	doi:10.1088/1757-899X/1168/1/012022	Greater Noida Institute of Technology, Greater Noida	IOP
14	VIBHA OBEROI, CSE	Invertis University, Bareilly	"Topology Based Routing Protocol in Vehicular Ad-Hoc Network"	VAN ET	September 11-12, 2020		2020		Invertis University, Bareilly	
15	VIBHA OBEROI, CSE	IEEE Pune Section	"Enhancement of QoS in Security Algorithm for Blackhole Attack in VANET"	VAN ET	December 16-		2020		IEEE Pune Section	



16	Neha Yadav		A Review on Cyber System Attacks iss	Inter	28-30 July 2020	international	2020	ISBN:978-1	Babasaheb Bhimrao Ambedkar University, A Central	Institute of Electrical and Electronics Engineers(IEEE)
17	Dr Anuranjan Misra	Computational Network Application Tools for Performance Management	Performance Enhanced and Improvised Approach to Reduce Call Drops Using LTE-SON				2020	978-981-32-5	GNIOT	Springer Singapore Pte Ltd
18	JAY SHANKAR PRASAD	Communications in Computer and Information Science book series (CCIS, volume 1229)	Predicting Trends of Stock Market Using SVM: A Big Data Analytics Approach	REDS Interna	International	International	2020	978-981-15-5	KEC, Ghaziabad	Springer
19	Prem Prakash Agrawal	Lecture Notes	Clustering Methods Analysis in the E-Learning	Proc Intern	International	International	2020	978-981-15-7	Galgotias University	Springer
20	Dr. Arun Kumar Singh		Upper half face recognition using hidden markov model and singular value decomposition coefficients	Advances in Computation			2020	978-981-15	GLBITM, Greater	Springer Singapore
21	Dr. Arun Kumar Singh		Security through Optimization Techniques of Firewall Rule Sets		2020 International Conference on Computation, Automation		2020	978-1-7281	GLBITM, Greater	IEEE
22	Dr. Arun Kumar Singh	Machine learning and cognitive computing for mobile communications and wireless networks	Significance of wireless technology in Internet of Things (IoT)				2020	9.781E+12	GLBITM, Greater	John Wiley & Sons, Inc.
23	Dr. Arun Kumar Singh		Research and Challenges of Security &	International Confere			2020	978-1-7281	GLBITM, Greater	IEEE
24	Dr. Arun Kumar Singh		Iterative Differential Evolution with Real	International Confere			2020	978-1-7281	GLBITM, Greater	IEEE
25	Dr. Arun Kumar Singh	An industrial IoT approach for pharmaceutical industry growth	Internet of things: From Hype to Reality				2020	978-0-12-82	GLBITM, Greater	Academic Press
26	Dr. Arun Kumar Singh		Diagnosis of Cough and Cancer U	Ambient Communications			2020	978-981-15	GLBITM, Greater	Springer, Singapore
27	Dr. Bhuvnesh Khokhar		Atom search optimization based study of frequency deviation response of a hybrid power system	9th IEEE Power India Int	PIICON 2020	International	2020	2642-5289	DCRUST, Murthal	IEEE
28	Dr. Bhuvnesh Khokhar		Model order reduction based LFC analysis of an autonomous microgrid	9th IEEE Power Int	PIICON 2020	International	2020	2642-5289	DCRUST, Murthal	IEEE
29	Dr. Jitendra Sharma		Robust PID control of single-axis gimbal actuator via stability boundary locus	6th IFAC Confere	ACODS 2020	International	2020	2405-8963	UP Roorkee	IFAC, ELSEVIER



30	Mr. Taranpreet kaur	Chapter in "Advances in Materials Processing and Manufacturing Applications, Proceedings of ICADMA 2020"	Performance of SoilTech MK III Polymer and Fly Ash on Problematic Soil, page 497	Advances in Materials Processing and Manufacturing	Springer Book	2020	ISBN 978-981-16-0908-4		Springer
31	Dr. Nancy Agarwal	13th annual Norwegian Information Security Conference	Us against the World: Detection of Radical Language in Online Platforms	13th NISK-2020	International	2020		Norway	European

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# Arduino Uno Based Time Glove Machine

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**Abstract:** This paper presented a time glove machine which is based on stroboscopic principle. The stroboscopic effect is a visual phenomenon caused by aliasing that occurs when a moving object is represented by a series of short samples as distinct from a continuous view, and the moving object is in rotational or other cyclic motion at a rate close to the sampling rate. For this we utilize Arduino UNO ATmega 328 as a brain of the system, accelerometer for synchronization, Relay as switching circuits, 100 watt LED Module and programming using embedded C.

**Keywords:** Time glove machine, Arduino Uno, Relay Module, Internet of Things etc.

## I. INTRODUCTION

Time glove machine is a machine which does not really cause a temporal rift in the space time continuum. This is based on stroboscope, nothing but a visual phenomenon, which occur when continuous motion is represented by a series of short samples or instantaneous samples. In other words, its electronic flashes that freeze the motion of any moving object; they can be used to set the timing on engines and to see what is happening in mechanical objects when they are in motion. It also accounts for the "wagon-wheel effect", so-called because in video, spoked wheels (such as on horse-drawn wagons) sometimes appear to be turning backwards. A strobe fountain, a stream of water droplets falling at regular intervals lit with a strobe light, is an example of the stroboscopic effect being applied to a cyclic motion that is not rotational. When viewed under normal light, this is a normal water fountain. When viewed under a strobe light with its frequency tuned to the rate at which the droplets fall, the droplets appear to be suspended in mid-air. Adjusting the strobe frequency can make the droplets apparently move slowly up or down.

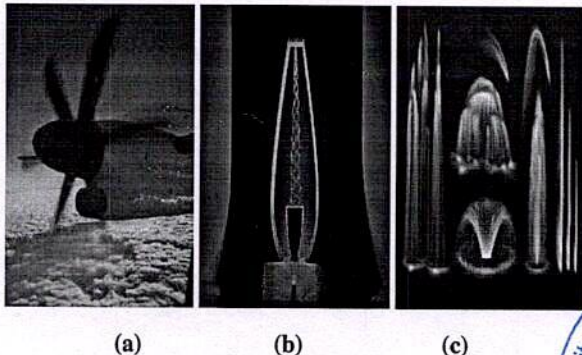


Fig. 1. (a) Wagon Wheel, (b) Strobe Light and (c) Water Droplet

For example the picture of Wagon wheel effect, a strobe fountain and a stream of water droplets are shown in figure 1.

## II. SYSTEM ARCHITECTURE

The architecture of system is broadly divided into two basic parts: hardware architecture and software architecture. Both hardware and software are integrates together to give purposeful embedded system.

### A. Hardware architecture

#### i. Arduino UNO

The embedded system is composed of Arduino UNO belonging to the ATMEL family. It is a 8-bit microcontroller having 32 kb of flash memory. It is a single board capable of performing flexible operations as an open source platform forms the brain of the embedded system. It has 14 digital pins and six analog pins which are used to interface with the other devices. It operates on operating voltage of 5V and requires dc input current per I/O pin is 20mA.

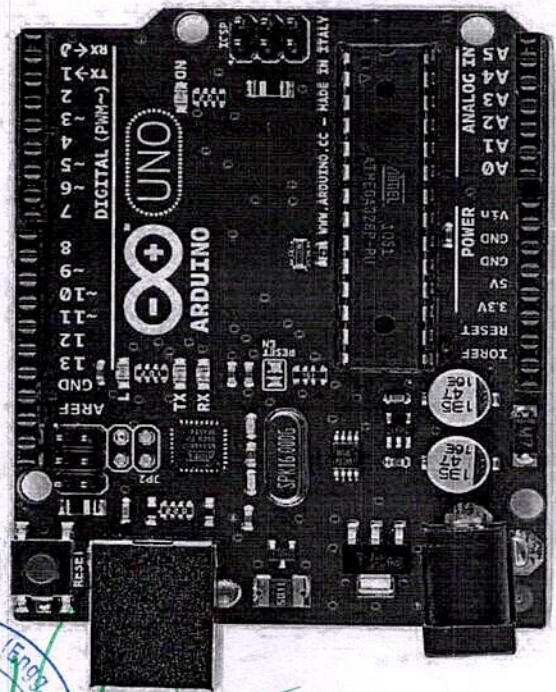


Fig. 2. Arduino UNO board



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International Conference on Computational Intelligence and Data Science (ICCIDS 2019)

## Reliability Analysis of Wireless Link for IOT Applications Under Shadow-Fading Conditions

Amit Sehgal<sup>a\*</sup>, Rajeev Agrawal<sup>a</sup>, Rakhi Bhardwaj<sup>b</sup>, Krishna Kant Singh<sup>a</sup>

<sup>a</sup>G.L.Bajaj Institute of Technology & Management Plot No. 2, Knowledge Park III, Gr. Noida, 201310, India  
<sup>b</sup>Greater Noida Institute of Technology, Knowledge Park III, Gr. Noida, 201306, India

### Abstract

Sensor nodes in IoT applications exhibit limited computing power, communication range and energy resource. These are some of the major constraints in the deployment of these systems. This leads to a multivariable optimization problem. Further, the variations in geographic conditions such as ground, terrain, atmosphere and mobility between various nodes introduces severe randomness in received signal strength at particular nodes. To mitigate this random nature of wireless link, probabilistic channel models are explored and analyzed. For more realistic estimation, multiple factors such as fading, shadowing, interference and noise must be considered simultaneously. In this paper, the reliability of wireless link in such environment is analyzed by capturing effect of these parameters through compound probability distributions. Expressions for Link and node outage have been obtained and measured through network simulation for reliability analysis. The comparative study with the other available fading models shows that the proposed model is more suitable in approximating real phenomenon of wireless link design.

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Peer-review under responsibility of the scientific committee of the International Conference on Computational Intelligence and Data Science (ICCIDS 2019).

**Keywords:** Internet of Things, Wireless Sensor Nodes, QoS, Compound Fading, Multipath Fading, Shadowing, Link Outage, Node Outage

### 1. Introduction

Developments in sensing technology and communication standards such as adaptive and ultra low power circuits, low power-long range wireless communication, distributed computing with low power and low cost processors has made Internet of Things (IoT) a bridge between virtual world and real physical world [1, 2, 3]. Still, the dynamic characteristics of signals in wireless channel introduce many new challenges. Major challenges of IoT devices are

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10.1016/j.procs.2020.03.362

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## **ABSTRACT No. – 40**

### **Wide-band Patch Antenna Design and Optimization**

**Anil Kumar Dubey**

Department of Electronics & Communication Engineering, GNIOT, Greater Noida

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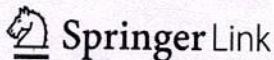
### **ABSTRACT**

In this paper microstrip patch antenna is proposed of dimension 30mm × 46.3mm of material having dielectric constant 2.2 for the military and satellite requirements. The proposed patch antenna is designed and simulated using electromagnetic simulator IE3D. Proposed designed patch antenna is analyzed by different designing parameters - return loss, voltage standing wave ratio and radiation pattern. Wide-bandwidth of patch antenna is achieved by optimizing designing parameters -defected ground structure.

Key words: Patch antenna, Return loss, VSWR, etc.







# Analytic and Simulative Modeling of RoF System with Intensity Modulation Including Fiber Dispersion Effect

Computer Communication, Networking and IoT pp 519-526 | Cite as

- Rajeev (1)
- Shelly Garg (2)
- Vishal Jain (1) Email author (vishaljain.ece@piet.co.in)

1. Panipat Institute of Engineering and Technology, , Samalkha, Panipat, India
2. Greater Noida Institute of Technology, , Greater Noida, India

Conference paper

First Online: 19 June 2021

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## Abstract

Radio over fiber (RoF) network is integration of two networks named as wireless and optical fiber networks. The conversion of the light signal from electric signal at the transmitter is the most challenging task in the radio over fiber system. Radio over fiber transmission of double sideband (DSB) optical signal undergoes frequency-dependent signal fading due to fiber dispersion. In this paper, fiber dispersion effect on RF signal amplitude is theoretically analyzed while using intensity modulation. Numerical and simulation result indicates that the variation of relative RF signal amplitude with respect to depth of modulation and length of the fiber is sinusoidal in nature. Analysis shows the dependence of RF signal amplitude on the modulation index, radio frequency of RF signal, and the length of the optical fiber. It is seen that the RF signal fundamental amplitude which is free from the harmonic sidebands, suffers from the dispersion induced fading only but the variation of the RF signal harmonic amplitude which include the harmonic sidebands with second order as well as the harmonic sidebands with fourth order, has the cyclic property with respect to fading. This cyclic variation depends on modulation index and is due to the harmonic sidebands that are generated through the nonlinear response of the intensity modulation.

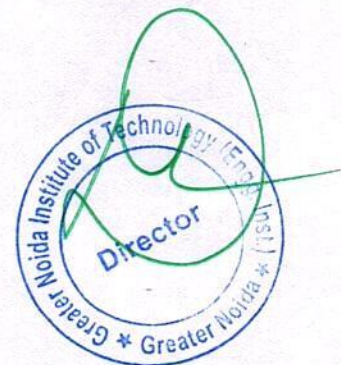
## Keywords

Optical fiber communication Electro-optic modulation non linear dispersion  
Intensity modulation Direct detection (IM-DD) Optical modulation

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## References

1. Lim, C., Tian, Y., Ranaweera, C., Nirmalathas, T.A., Wong, E., Lee, K.-L.: Evolution of radio-over-fiber technology. *J. Lightw. Technol.* **37**(6), 1647–1656 (2018)  
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## Optimization of process parameters of A-359 aluminium alloy in EPS-assisted-investment casting process using Taguchi method

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# Optimization of process parameters of A-359 aluminium alloy in EPS-assisted-investment casting process using Taguchi method

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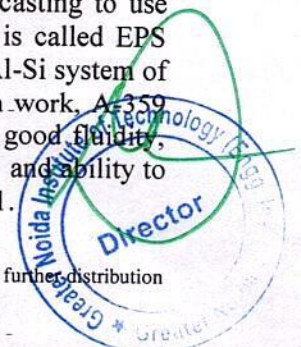
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**Abstract.** The purpose of this research is to optimize the process parameters such as pouring temperature, pouring time and the thickness of coating using Taguchi mod in expandable polystyrene assisted investment casting process. In this paper, zircon flour and mullite sand with potassium silicate binder and coarse fused-silica sand stucco are used as coating materials. Problems like cracking, breaking, bending, expanding and distending in shell are eliminated by preheating the shell and slowly rise in temperature, during foam removal process. For maximum impact strength, the optimum values of process parameters- pouring temperature, pouring time and thickness of coating layers are 750°C, 15 seconds and 5 mm respectively.

**Keywords:** Expandable Polystyrene Pattern, A-359 Aluminium Alloy, Pouring temperature, Pouring time and Thickness of coating layers, Taguchi Method.

## 1. Introduction

In present time, the dimensional accuracy and surface finish of casted complex shape products have become a critical issue to reduce machining cost. So, different types of casting processes have been introduced. In this row, two types of castings are preferred named as evaporative pattern casting (EPC) and investment casting process. But evaporative pattern casting is facing problems of pin holes, porosity, ash content etc. in castings [1-2]. In investment casting process, these defects can be reduced. Generally, wax patterns are used in investment casting. But due to low softening point, the change in shape of wax pattern takes place. Another problem is to handle the big and complex shapes of wax pattern [3-4]. To remove these problems, there is a great opportunity in investment casting to use Expandable Polystyrene pattern, instead of wax pattern. This hybrid casting process is called EPS Assisted Investment Casting Process [5-6]. To achieve good characteristics of casting, Al-Si system of aluminium alloys is preferred. The range of Si may vary 4% to 13%. In this research work, A-359 aluminium alloy has been selected because of it has low melting point, high strength, good fluidity, low ductility, decreased corrosion resistance and surface roughness, good grain structure and ability to increase the strength by heat treatment [6]. The composition of A-359 is shown in table-1.



# Regression Analysis of COVID-19 using Machine Learning Algorithms

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**Abstract**— The outbreak of the Novel Coronavirus or the COVID-19 in various parts of the world has affected the world as a whole and caused millions of deaths. This remains an ominous warning to public health and will be marked as one of the greatest pandemics in world history. This paper aims to provide a better understanding of how various Machine Learning models can be implemented in real-world situations. Apart from the analysis done on the world figures, this paper also analyzes the current trend or pattern of Covid-19 transmission in India. With the help of datasets from the Ministry of Health and Family Welfare of India, this study puts forward various trends and patterns experienced in different parts of the world. The data to be studied has been obtained for 154 days i.e. from January 22, 2020, till June 24, 2020. For future references, the data can be further analyzed, and more results can be obtained.

**Keywords**— COVID-19, Machine Learning, Data Analysis, Trend Analysis

## I. INTRODUCTION

According to the World Health Organization (WHO), viral and infectious diseases continue to appear and pose a serious threat to public health and well-being. Coronavirus is a broad family of viruses which causes ailments ranging from common cold and flu to severe respiratory issues. According to NCBI, "In the last 20 years, there have been several viral epidemics that have been reported such as the Severe Acute Respiratory Syndrome Coronavirus or better known as SARS-CoV which was declared a pandemic by WHO in 2002 - 2004 and H1N1 influenza in 2009. With most recently, Middle East Respiratory Syndrome Coronavirus better known as MERS - CoV which hit its first outbreak in Saudi Arabia in 2012" [1].

In the chronology of modern times, cases of unrecognized low respiratory infections were first detected during the mid December 2019 in Wuhan, the largest metropolitan city in Hubei province of China. This strange new pneumonia was named "COVID-19" by WHO. WHO declared this surge a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 as it had affected almost 20 countries of the world [2]. There are no specific treatments of this virus so far, but one can reduce the spread of infection by maintaining personal hygiene and social distancing. There

have been recoveries around the world, but the pandemic is still not under control.

Since this pandemic has affected the whole world not only in terms of health and hygiene but also in terms of the global economy. Apart from the adverse effects of COVID-19, there have been certain constructive influences around the world. As the world was facing loses, our nature gained something from this pandemic, the harmful particulate matter was eliminated from the environment and most importantly the largest ever ozone hole detected was closed during this pandemic. So it becomes really important to understand the features and characteristics of this disease and predict/estimate the further spread of this disease around the world and how it is going to impact the coming generations and the lives of the people when things become normal.

The timeline of the events of COVID-19 across different nations [2] is shown in Fig 1. and the percentage of confirmed cases per country is shown by Fig 2.

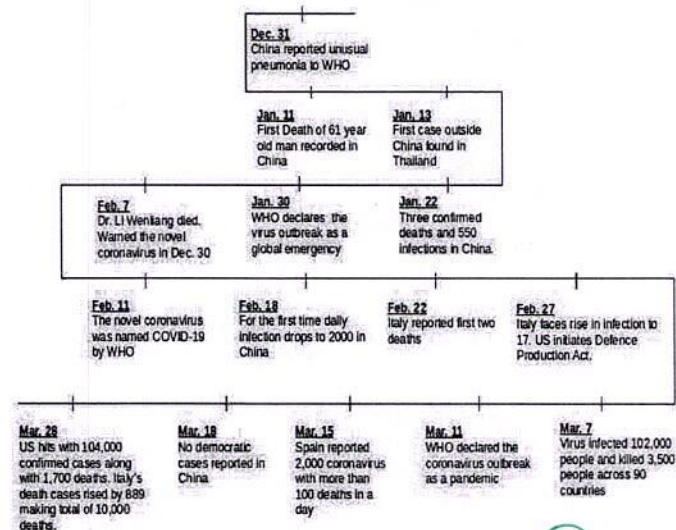
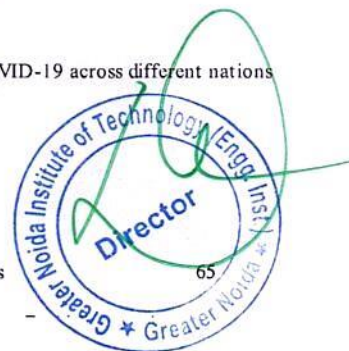


Fig. 1. Timeline of the events of COVID-19 across different nations



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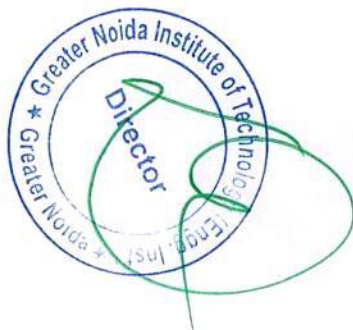
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# Optimization of FDM 3D printing process parameters using Taguchi technique

Kuldeep Sharma, Kapil Kumar, Rishi Kumar Singh and M S Rawat

Greater Noida Institute of Technology, Greater Noida, UP, India

**Abstract.** Fused deposition modelling (FDM) is a fast growing and low-cost 3D printing technology in order to comply most prominent demands of today's industries in terms of capability to fabricate complex parts along with high flexibility in design. The dimensional accuracy, is an urgent need of final parts printed by FDM process, that is primarily influenced by the process parameters. Optimizing the process parameters which significantly influence the dimensional accuracy is the primary goal of this study in order to achieve the ultimate final part quality. This experimental study investigates the effect of different process parameters viz. layer height, raster angle, nozzle temperature and surrounding pressure on thickness of the final part for Poly Lactic Acid (PLA) filament. Experiments, based on Taguchi's L9 orthogonal array, were performed and subsequently experimental data have been analysed by ANOVA. It has been observed that the layer height is the most significant factor in order to achieve the dimensional accuracy.

Key words- FDM, Taguchi Method, ANOVA

## 1. Introduction

3D (3 Dimensional) printing or Additive manufacturing (AM) has gained great popularity over the past few years due to its ability to produce complex objects with ease, available sizes, flexibility of usable materials, easy handling and wide range of applications such as engineering industry, medical sciences, food industry, construction, aeronautics, textile industry, automotive industry and so on [1]. There are various methods of Additive Manufacturing such as stereolithography, syringe extrusion, selective layer sintering, fused deposition modelling(FDM)/fused filament fabrication(FFF) being used over the field of its applications as per the requirements of industry but Fused Deposition Modelling (FDM) has become the most widely employed rapid prototyping technique among other methods [2]. FDM uses a temperature controlled head to extrude semi liquid thermoplastic through a nozzle of fixed orifice in layer by layer formation, shown in figure 1[3], the movement of printing head is controlled by a computer aided manufacturing (CAM) software[4].

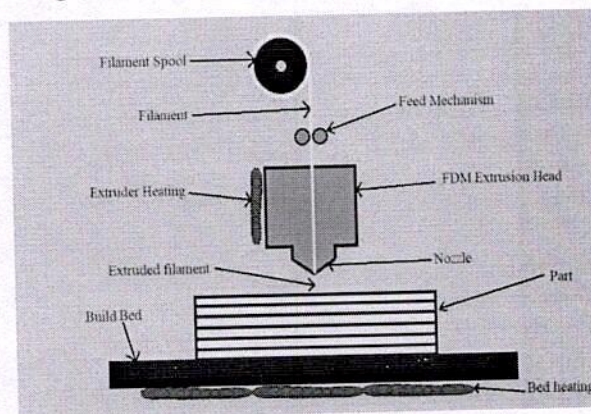
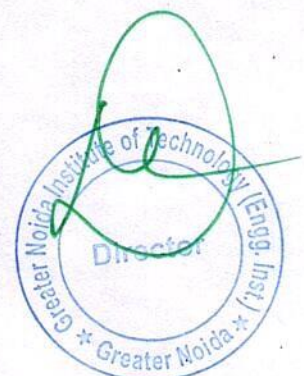


Figure 1 FDM Process Schematic

Researchers are continuously working towards improving different characteristics of FDM produced parts by tweaking with different process parameters and stating a range of optimum settings for a FDM machine and material at which the strength or production time or production cost or any other aspect is



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# A Review on Cyber Physical System Attacks: Issues and Challenges

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- IV. CPS Architecture
- V. Security Parameters of Cyber Physical System

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## Abstract:

Recent advancement of cyber physical systems open doors to various safety measures, threats, attacks and vulnerabilities are such major key challenges now days. The globally adoption of cyber physical systems basically forms a basis for cyber social attack in order to breakdown secure channel and control actions. Hence loopholes and vulnerabilities in trending cyber physical systems are targeted to make systems unstable and unsafe state. The subjection of CPSs causes new critical issues for research and academics. However expeditious growth of CPS devices a question marks on security, integrity and confidentiality. The paradigm which forms basis for CPS are Smart phones, Defense System, Meteorology, Big data, Smart Technologies and Smart Vehicles. The purpose and analysis behind this paper to find out security issues and challenges of CPSs. Comparison of various cyber physical attacks and analysis on several parameters has been done. Key noted issues are results of cyber attacks, CPS attack traceability and the review on communication security architecture.

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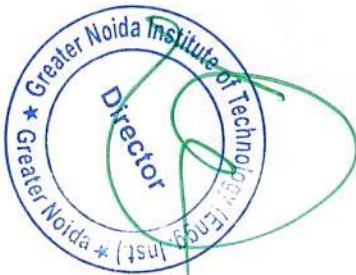
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# Security through Optimization Techniques of Firewall Rule Sets

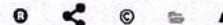
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**Abstract:**In the computer age, security is an essential requirement of network infrastructure for communication. A firewall works as a shield in multinational corporate network sec... [View more](#)

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**Abstract:** In the computer age, security is an essential requirement of network infrastructure for communication. A firewall works as a shield in multinational corporate network security. Firewall mainly is a security policy that consists of a set of rules which form a secure network by inspecting and filtering the incoming traffic to the network. A firewall is configured to maintain a set of rules to preserve its integrity. Firewall complexity increases the number of rules in the rule set, which then hampers the overall performance of the firewall. Studies have proved that there is a critical requirement of constructing a network configuration and put to rout the structure in a manner that the chances of security loopholes are minimized. As a firewall is mainly designed for multinational corporate networking, altering the rules in any firewall requires rigorous analysis of both inter and intranet firewalls. Thus we put forward a probate solution and sum up the efficacy of the algorithm through simulation. Accordingly, the asserted algorithm minimizes the initial firewall rule set by multiple times when compared to others.

**Published in:** 2020 International Conference on Cornputation, Automation and Knowledge Management (ICCAKM)

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Machine Learning and Cognitive Computing for Mobile Communications and Wireless Networks

Chapter 6

## Significance of Wireless Technology in Internet of Things (IoT)

Ashish Tripathi, Arun Kumar Singh, Pushpa Choudhary, Prem Chand Vashist, K. K. Mishra

Book Editor(s): Krishna Kant Singh, Akansha Singh, Korhan Cengiz, Dac-Nhuong Le

First published: 17 June 2020

<https://doi.org/10.1002/9781119640554.ch6>

### Summary

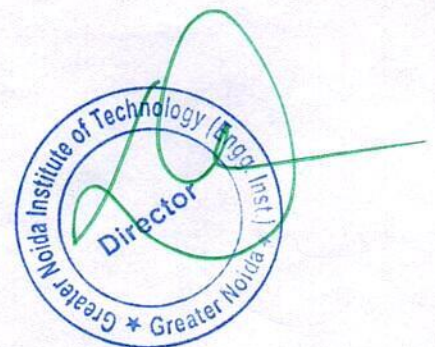
In recent years, it is found that wireless technology has played a significant role in the evolution of the Internet of Things (IoT) to make the society smarter in all aspects of people's lives. IoT is applicable in domains such as education, transportation, retail, smart farming, healthcare, smart wearable devices, smart homes, transportation, retail, and security. According to Cisco, in India by 2020, more than 50 billion devices will be connected to the Internet, including smartphones, computers, and any electronic devices/ things. Although the IoT is expanding rapidly and industries are investing money and effort to create new IoT applications, still it faces some issues such as the selection of appropriate wireless protocols, interoperability among wireless standards, security issues, inference among wireless devices, and trade-off among power consumption, rate of data transfer, and coverage range. So choosing the right wireless technology addresses the issues outlined above, for developing IoT applications can be very challenging. This chapter presents an overview of the key issues related to the selection of different wireless technologies in the development of IoT services. A number of research challenges have been identified as a major research trends in the IoT environment. Details of the hardware components are discussed. Also, the chapter discusses the significance of wireless technology in IoT followed by a complete overview of the various wireless-enabled IoT networks, connections, and protocols. Finally, concluding remarks are given.

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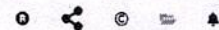
# Research and Challenges of Security & Privacy in Internet of Things (IoT)

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##### Abstract:

In today's modern lifestyle the internet is a very basic and needy requirement. The Internet of Things (IoT), it's a conception that indicates how it would be if all the things (physical objects) of the world that are used in daily use are connected to the Internet. In this IoT, it is supposed to recognize all the connected devices that are connected with the Internet. The meaning of IoT is the connection among "things" such as controllers, machines, people, and sensors with restricted networks through the internet or other communication techniques throughout a novel approaches to built intelligence networks. All of the daily things used within these devices include washing machines, coffee makers, all wearable devices headphones, lamps, cell phones, and everything we can think of. So we can say that IoT is a conceptual environment of physical things that interacts with other things (devices). Security is a major concern of IoT nodes such as users, servers, objects and things with the association of confidentiality, integrity, and availability (CIA). Privacy is the subpart of security its role is very much important in various IoT Services and applications, which may be harmed by an eavesdropper.

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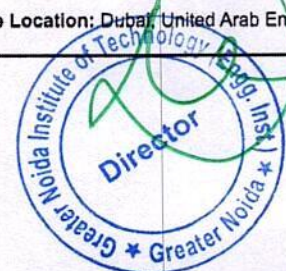
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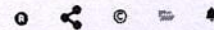
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**Abstract:** Evolutionary algorithms are a sub-discipline of artificial intelligence to solve various real-world problems. These algorithms are based on the Darwinian principle of evolution. [View more](#)

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**Abstract:** Evolutionary algorithms are a sub-discipline of artificial intelligence to solve various real-world problems. These algorithms are based on the Darwinian principle of evolution and so is the name evolutionary algorithm. Differential Evolution (DE) algorithm is a kind of evolutionary algorithms which are used for optimizing a problem mostly for real-valued functions. It uses random solutions and creates new solutions from the previous or existing solutions. This population based algorithm applies three operators namely selection, crossover and, mutation. In this work, a new strategy has been developed to improve the performance of the basic DE algorithm. Also, the resultant performance is compared to other optimization algorithms which show that modified DE is performing better than other existing algorithms.

**Published in:** 2020 International Conference on Computation, Automation and Knowledge Management (ICCAKM)

**Date of Conference:** 09-10 January 2020

**INSPEC Accession Number:** 19495347

**Date Added to IEEE Xplore:** 02 April 2020

**DOI:** 10.1109/ICCAKM46823.2020.9051484

**Publisher:** IEEE

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**Conference Location:** Dubai, United Arab Emirates

Contents

I. Introduction





## An Industrial IoT Approach for Pharmaceutical Industry

Growth

Volume 2

2020, Pages 191-230

## Chapter 7 - Internet of Things: from hype to reality

Arun Kumar Singh<sup>1</sup>, Neda Firoz<sup>2</sup>, Ashish Tripathi<sup>1</sup>, K.K. Singh<sup>3</sup>, Pushpa Choudhary<sup>1</sup>, Prem Chand Vashist<sup>1</sup>

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## Abstract

The era of the Internet of Things (IoT) is sweeping over and replacing the Internet creating a world where smart things exist connected to each other intelligently. This was predicted by Eric Emerson Schmidt, the former C.E.O. of Google over 20 years ago. The physical world is now connecting to the digital world so quickly with the emergence of the IoT that it seems the Internet will become invisible soon, meaning the physical world will be connecting to the digital world seamlessly. The world will enjoy smart connectivity in the same way that the city of Barcelona has emerged to be the smartest city in the world. We are moving toward system-to-system connection, with smart networking reaching its peak. The idea of software-defined autonomous machines is about to become hugely important, which will become ubiquitous. With the advent of the IoT, we explore how it is becoming a reality and whether it has any limits. Maciej Kranz in his book on the IoT explains the very essential detailed and inclusive idea of the IoT, with IoT expanding to businesses, and covering and impacting on a variety of technology areas. Artificial intelligence and machine learning have a huge scope because of the enormous data generated by sensors and devices connected through the IoT. We will explore in this chapter the hype around the IoT and the reality. We will also discover improved metrics in the IoT that is allowing it to be a leader in the technological world. We are witnessing the fourth revolution in the digitization world and discuss the reasons behind its exponential growth. The protocols that differentiate them from others have evolved for IOT in a new set of patterns. This also creates security concerns and data are described as the new oil, raising further challenges of data privacy.

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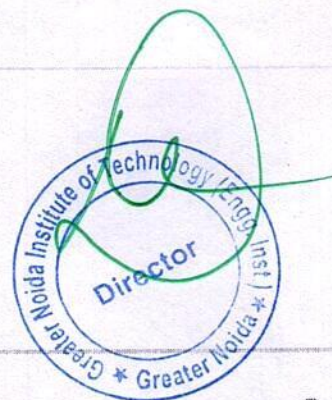
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## Diagnosis of Cough and Cancer Using Image Compression and Decompression Techniques

[Ashish Tripathi](#), [Ratnesh Prasad Srivastava](#), [Arun Kumar Singh](#), [Pushpa Choudhary](#) & [Prem Chand Vashist](#)

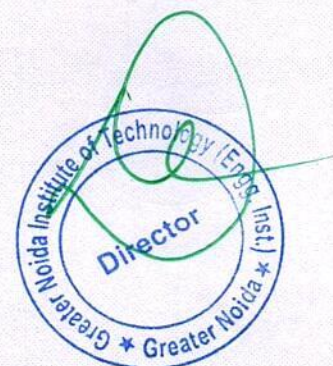
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### Abstract

This paper is dedicated to provide a technique with an innovative approach which can efficiently compress and recognize medical images. Since medical images are huge in size, therefore, compression of medical images is needed. Then, recognition capability is tested with the compressed and the uncompressed images. Basically, in this paper, two steps have been used to identify the disease. In the first step, the physical size of the medical image is reduced, and in the



# Atom search optimization based study of frequency deviation response of a hybrid power system

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**Abstract**—This paper attempts a maiden application of a newly developed Atom Search Optimization (ASO) algorithm for the load frequency control (LFC) of a hybrid power system (HPS). The investigated HPS consists of conventional as well as distributed generation (DG) sources. An ASO algorithm based integer order proportional integral derivative (PID) controller is implemented as the LFC controller. A comparative analysis of frequency deviation response (FDR) of the HPS subject to multiple disturbances in load and wind power is presented. The simulation results demonstrate a superior performance of the proposed algorithm compared to the other algorithms. Additionally, operational stability of the HPS is established via Bode diagram and Eigen values.

**Index Terms**—Atom search optimization, load frequency control, PID controller, hybrid power system

## NOMENCLATURE

$f$	nominal frequency (Hz)
$ITAE$	integral of the time multiplied absolute error
$T_{sim}$	simulation time (s)
$K_{PS}$	power system gain
$T_{PS}$	power system time constant (s)
$R$	governor speed regulation coefficient (Hz/pu MW)
$T_G$	governor time constant (s)
$T_T$	turbine time constant (s)
$T_{DEG}$	DEG time constant (s)
$K_{DEG}$	DEG gain
$T_{BESS}$	BESS time constant (s)
$K_{BESS}$	BESS gain
$T_R$	Reheater time constant (s)
$K_R$	Reheater gain
$T_{WTG}$	WTG time constant (s)
$K_{WTG}$	WTG gain
$T_{AE}$	AE time constant (s)
$K_{AE}$	AE gain
$T_{FC}$	FC time constant (s)
$K_{FC}$	FC gain

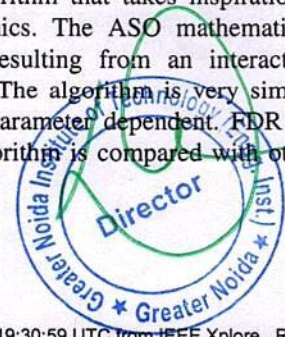
## I. INTRODUCTION

Day by day burgeoning power demand is draining the conventional fossil fuels at an alarming rate. Sooner or later the fossil fuel deposits will become obsolete. Consequently, researchers all over the world are prioritizing the renewable sources of energy (RSE) for power generation. The RSEs

possess an inherent advantage of availability in abundance and pollution free operation. Major RSEs include wind power and solar power. The RSEs along with DG sources like diesel engine generator (DEG), fuel cell (FC), etc. when operated at the medium voltage (MV)/low voltage (LV) levels forms a microgrid (MG). A MG is capable of operating in grid-connected as well as standalone modes. Clinging to the fact of bolstering power demand, it would be fruitful to operate the DG sources in coordination with the conventional power system in order to alleviate burden on the latter. Such a coordination of the conventional and DG power sources forms a HPS. In such a scenario the MG is said to operate in grid connected mode. For small disturbances, the frequency and voltage analysis may be considered as a separate entity. The intermittent nature of the wind and the solar powers may cause a mismatch between the power generation and load demand thereby deviating the system frequency from its steady state value. Thus, LFC in such a case becomes of utmost prominence. LFC aims to maintain a reasonably uniform system frequency by curtailing the mismatch between the power generation and the load demand.

Several control strategies including integer order [1], fractional order [2], degree of freedom [3], [4], robust [5], [6] etc. have been studied in the past for the LFC analysis of the power system. In order to optimize the controller gains innumerable metaheuristic optimization algorithms are available in the literature. Some of these are the JAYA algorithm [7], multi-verse optimization (MVO) [8], grey wolf optimizer (GWO) [1], salp swarm algorithm (SSA) [9], whale optimization algorithm [10], grasshopper optimization algorithm (GOA) [11] etc.

As per no-free-lunch (NFL) theorem, no metaheuristic algorithm is well suited for solving all the optimization problems [12]. Consequently, this paper proposes a maiden application of the ASO algorithm [13] for the LFC analysis of a HPS. The ASO is a novel physics-based metaheuristic optimization algorithm that takes inspiration from the basic molecular dynamics. The ASO mathematically models the atomic motion resulting from an interaction force and a constraint force. The algorithm is very simple to implement and hardly any parameter dependent. FDR of the HPS with the proposed algorithm is compared with other algorithms of



# Model order reduction based LFC analysis of an autonomous microgrid

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**Abstract**—This paper investigates the load frequency control (LFC) issue of an autonomous microgrid (MG). A conventional proportional-integral-derivative with filter (PIDF) controller is implemented to reduce the oscillations in the system frequency. Gains of the controller are optimized using a newly developed metaheuristic optimization algorithm known as sine cosine algorithm (SCA). A reduced order model (ROM) of the autonomous MG is derived and investigated. Time and frequency responses (TFR) of the ROM are compared with that of the normal order model (NOM) of the MG. Results demonstrate that the TFRs of the ROM approximately replicate that of the NOM of the MG. Frequency dynamics of the autonomous MG with the proposed SCA based controller are obtained subject to multiple disturbances and are compared with other algorithms of repute available in literature. Results clearly demonstrate the superiority of the proposed controller in terms of reduced frequency oscillations, peak over/undershoots (PO/PU) and settling time ( $T_{set}$ ).

**Index Terms**—Load frequency control, PIDF controller, autonomous MG, sine cosine algorithm, model order reduction

## NOMENCLATURE

$f$	nominal frequency (Hz)
$ITAE$	integral of the time multiplied absolute error
$T_{sim}$	simulation time (s)
$D$	load damping coefficient (pu MW/Hz)
$M$	inertia constant of the MG (s)
$T_{DEG}$	Diesel engine generator (DEG) time constant (s)
$T_{MT}$	Micro turbine (MT) time constant (s)
$T_{FC}$	Fuel cell (FC) time constant (s)
$T_{WTG}$	Wind turbine generator (WTG) time constant (s)
$T_{PV}$	Photo voltaic (PV) time constant (s)
$T_{BESS}$	Battery energy storage system (BESS) time constant (s)
$T_{FESS}$	Flywheel energy storage system (FESS) time constant (s)

## I. INTRODUCTION

Our existing conventional power systems hold a major share in deteriorating the human as well as environmental well-being. Simultaneously, increasing energy crisis worldwide present even greater challenges. Thereupon, researchers are focusing primarily on renewable energy sources (RES) for power generation. The RESs possess a low carbon emission and are available in abundance. Major RESs include solar power and

wind power. A MG consists of various distributed generation (DG) sources like WTG, PV, FC systems, etc. along with various energy storage devices and loads that are operated in a decentralized manner either in standalone or grid-connected mode. By virtue of its low inertia in reference to standalone mode of operation and the intermittent nature of the solar and the wind powers, frequency control in such a mode becomes complex and crucial as well. Hence, LFC is employed in the MG to minimize the frequency oscillations and thus, to restore the system frequency within certain prespecified limits.

To investigate the LFC issue in power system, several control approaches have been proposed in the past. Shankar and Mukherjee studied the optimal LFC performance of a hybrid power system employing classical controllers [1]. A two stage fuzzy approach was proposed by Annamraju and Nandiraju for the frequency control of an autonomous MG in [2]. A fractional order controller was proposed by Pan and Das to investigate the LFC issue in a hybrid power system [3]. Guha, Roy and Banerjee studied a 3 degree-of-freedom PID controller to stabilize the frequency fluctuations in a hybrid power system [4]. Various robust control strategies including model predictive control (MPC) [5],  $H_\infty$  and  $\mu$ -synthesis approach [6] and internal model control (IMC) [7] have been successfully implemented for the LFC analysis of the power system. Growing complexities and nonlinearities in power systems demand a fast and accurate tuning of the controller parameters for the LFC analysis. Various meta heuristic optimization algorithms including differential search algorithm (DSA) [8], symbiotic organism search algorithm (SOSA) [9], dragonfly algorithm (DA) [4], black hole algorithm (BHA) [10], enhanced JAYA (EJAYA) algorithm [11] are available in literature for tuning the parameters of LFC controller.

Modeling of a complex power system for the LFC analysis demands an excellent understanding of the underlying dynamical behaviors of the system. Although such complex systems possess higher accuracy but at the same time loses simplicity. One of the commonly used approach to this problem is the model order reduction (MOR) process that aims at reducing the complexity of the system and simultaneously replicating the dynamical behavior of the complex system [12], [13]. Certain methods are available in the literature to obtain a reduced

## Robust PID Control of Single-axis Gimbal Actuator via Stability Boundary Locus

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**Abstract:** The gimbal or inertial stabilization platform (ISP) is used to stabilize the payload's line of sight (LOS) towards a stationary or moving target. It can be achieved if there is isolation between the payload and the base of the gimbal. This paper presents a single-axis gimbal loop in which the LOS rate is stabilized using a robust proportional-integral-derivative (PID) controller. The PID controller parameters are obtained by using a graphical technique known as stability boundary locus (SBL) approach such that the overall gimbal stabilization loop will have some minimum specific gain margin and phase margin. The PID controller is further designed in the presence of time delay. The proposed controller is compared with PI control scheme available in literature for rise time, settling time, percentage overshoot, ISE, ITSE, IAE, and ITAE. The simulations are carried out in MATLAB which exhibit better results in comparison with PI control based approach.

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**Keywords:** Gimbal, PID control, Specific gain margin and phase margin, Stability boundary locus, Time delay.

### 1. INTRODUCTION

Gimbal is basically a pointing device used in many diverse industries like aerospace, medical, defense, remote sensing etc. The payload to a gimbal is typically a sensor like camera but it can be anything like radar, missile, gun, laser etc. which requires a highly accurate aiming to the target. A gimbal consists of rings pivoted at right angles to each other. A gimbal can stabilize an object or payload with respect to a single-axis or multiple-axis of rotation. A two-axis gimbal can stabilize a payload along pitch (elevation) and yaw (azimuth) axis whereas a three axis gimbal will have an additional stabilization axis known as roll axis. A gimbal is sometimes referred to as an inertially stabilized platform (ISP). Recently, a lot of research work have been done on the modeling and control of single and multiple-axis gimbal.

In Obiora and Achumba (2017), a fuzzy-PID controller is designed for aerial vehicle gimbal system. The dynamic modeling of aerial vehicle gimbal is done by using the independent joint control technique. An adaptive dynamic surface controller is synthesized for a two-axis pointing antenna gimbal system having actuator dynamics and parametric uncertainties by Khayatian and Arefi (2016). A gain scheduled controller is designed for three-axis attitude control of a double gimbal variable speed control moment gyro by using the LMI approach and  $H_2/H_\infty$  constraints by Sasaki et al. (2018). In Li et al. (2017a), a disturbance observer based state feedback controller is designed for composite decoupling control of double gimballed variable

speed control moment gyro (CMG) in a gimbal servo system. In Li et al. (2016), dynamic decoupling control of double gimballed control moment gyro (DGCIMG) in a gimbal system is achieved via state feedback linearization approach.

A fractional order proportional-integral (FOPI) controller has been designed for inertially stabilized gimbal platform by Caponetto and Xibilia (2017). In Cui et al. (2017), combined time delay control and internal model control (IMC) has been applied to a magnetically suspended CMG in a gimbal system for compensating the friction effects. In Ahi and Nobakhti (2018), active disturbance rejection control (ADRC) technique is implemented on the gimbal mechanism hardware. In Huang et al. (2018), extended harmonic disturbance observer with backstepping controller is fabricated for high precision anti disturbance control of gimbal system. In Fang and Ren (2011), composite technique of inverse system control and IMC has been implemented for high precision control of single gimbal magnetically suspended CMG. Neural network based sliding mode control approach has been implemented for disturbance rejection of a inertially stabilized platform (ISP) having actuator saturation in a gimbal system by Ding et al. (2019). In Abdo et al. (2015), two axes gimbal seeker system has been explored using cascade PID control design approach. In Zhan et al. (2014), optimal feedback stabilization control via linear matrix inequality (LMI) and convex optimization based technique is applied on a two axis gimbal system having saturation nonlinearity and various disturbances. In Majumder et al. (2018), integrated dynamic modeling



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# Performance of SoilTech MK III Polymer and Fly Ash on Problematic Soil



Taranpreet Kaur, Pardeep Singh, and Heena Malhotra

**Abstract** Roads are considered the best mode of transportation, and after USA, Indian road network is the world's second largest road network in the world. According to the Ministry of Road Transport and Highways, March 2019, India had about 142,126 km (88,313 mi) of national highway and expressways and 176,166 km (109,464 mi) of state highways (Rajput and Yadav in Int. J. Innov. Res. Sci. Technol. 2(3):9–13, 2015). Road's thickness depends upon its geotechnical properties and the load applied to it. Good pavement should follow some guidelines like it should be safe, economical, and comfortable. This research describes the impact of SoilTech MK III Polymer and Fly Ash as stabilizer on black cotton soil and on clay and the positive impact on the pavement as well as on the cost of the pavement. For this research, 20% Fly Ash and 0.2, 0.4, 0.6, and 0.8% SoilTech MK III Polymer were used. With the addition of Fly Ash and SoilTech MK III Polymer, the OMC value increases and the value of MDD decreases. CBR value also increases with the combination of these two materials. The optimum mix obtained to improve the construction of pavements with poor strength was 79.2:20:0.8 (Sample: Fly Ash: SoilTech MK III Polymer). Because of these stabilizers, the cost of pavement reduces up to 20–30%.

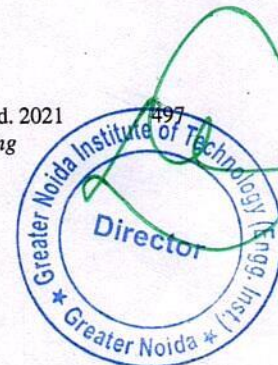
**Keywords** Black cotton soil (BCS) · Clay · SoilTech MK III Polymer · Fly Ash · California bearing ratio (CBR)

## 1 Introduction

It is always a challenge for highway engineer to improve the geotechnical properties of the problematic soil at that time. Stabilization is one of the best methods adopted by the engineers. Chemical stabilization [1], mechanical stabilization, and biological [2] are such methods which are implemented on weak soil to improve its properties so that the service life of the pavement can be increased [3, 4]. Various

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## Us against the World: Detection of Radical Language in Online Platforms

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Section

Artikler

### Abstract

In this paper, we have investigated if we can detect radical comments in an online social network. We used comments from 6 subreddits, 3 of which are considered radical and 3 non-radical. Using various structural features of the texts in the comments, we were able to obtain an F1-score of 91% when using SVM with a linear kernel and a precision of almost 98% when using Random Forest.

