

Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13. <u>RSM POLY</u> Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.

#### **Newsletter Published Monthly**

Vol: III, Issue: 2

# **RSM POLY NEWSLETTER – FEB 2021**

## **ABOUT MVP SAMAJ**

The **Maratha Vidya Prasarak Samaj** is one of the most prestigious centers of learning in the State of Maharashtra. It manages 485 educational units and is one of the premier educational hub in the Nashik district.

At present, more than 2 lakhs of students are pursuing education. Over past 106 years, the institute has stood the test of time to become legend of unparalleled stature. History says that the credit for the birth of M.V.P. Samaj goes to the young, enthusiastic & devoted team of social workers and educationists who were inspired by the lives of Mahatma Jyotiba Phule, Savitribai Phule and Rajarshi Shahu Maharaj of Kolhapur. These young leading lights include Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute, Ganpat Dada More, D. R. Bhonsale, Kirtiwanrao Nimbalkar and Vithoba Patil Khandalaskar, who laid the foundation of the Samaj. They were the men who envisioned the culture and knowledge centric society. The great visionaries of MVP Samaj rightly laid the "Well being and happiness of masses" as the motto for the Samaj.

## ABOUT RSM POLYTECHNIC

The **Rajarshi Shahu Maharaj Polytechnic** has been established in the year 2008, at the central place in Nashik. It is affiliated to MSBTE, Mumbai and approved by Government of Maharashtra, DTE Mumbai and the AICTE, New Delhi. The Polytechnic is in the process of Accreditation and Gradation. The Polytechnic has well-equipped and well-furnished laboratories, workshop and hostel facilities. Every department has separate computational facilities along with LAN, Wi-Fi and necessary software. At present the RSM Polytechnic provides three-year courses leading to Diploma in Engineering of MSBTE, Mumbai in the five disciplines: Mechanical Engineering, Computer Technology, Electronics and Telecommunication Engineering, Information Technology and Electrical Engineering.

## VISION AND MISSION VISION:

• To Empower the Common Masses by providing Quality Technical Education.

### **MISSION:**

- To create and implement innovative best practices to achieve academic excellence.
- To enhance the overall development of students by imparting essential skills.
- To inculcate principles of professional activities by promoting industry institute interaction and entrepreneurial skills.
  - To create an environment awareness for sustainable development.

Maratha Vidya Prasarak Samaj's Rajarshi Shahu Maharaj Polytechnic, Nashik



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## **MVP RSM Polytechnic**

 Birth Anniversary of Karmaveer Annasaheb Murkute (12<sup>th</sup> Feb 2021)



The Birth Anniversary of Karmaveer Annasaheb Murkute was celebrated by faculties and supporting staff members.

 Guidance Session on RSM V-Lab (13<sup>th</sup> Feb 2021)



RSM V-Lab Team has organized guidnce session on Introduction of Virtual Labs for all Faculties. The Session was conducted and coordinated by Prof. S. A. Suryawanshi and Prof. R. S. Derle.

 Birth Anniversary of Chhatrapati Shivaji Maharaj (19<sup>th</sup> Feb 2021)



The Birth Anniversary of Chhatrapati Shivaji Maharaj was celebrated by faculties and supporting staff members with social distancing.

 Death Anniversary of Karmaveer Adv. Baburao Ganpatrao Thakare (23<sup>rd</sup> Feb 2021)



The Death Anniversary of Karmaveer Adv. Baburao Ganpatrao Thakare was celebrated by faculties and supporting staff members.



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## **NEWSLETTER: FEB 2021**

Mechanical Engineering Department		Computer Technology Department					
Sr #	Activities	Date(s)	Sr#	Activities	Date(s)		
1.	Attended Acreserve 2020 - 2021	30 <sup>th</sup> Jan 2021	1.	Conducted Guest Lecture on Upcoming MSBTE W-2020	8 <sup>th</sup> Feb 2021		
				Online Examination			
2.	Conducted Online Quiz on	9 <sup>th</sup> Feb 2021					
	Refrigeration and Air		CF				
	Conditioning	011					
3.	Conducted Guest Lecture	12 <sup>th</sup> Feb 2021					
	on Upcoming MSBTE W-						
4	2020 Online Examination	12 <sup>th</sup> Each 2021	<b>LA.</b>				
4.	on Eluid Dining in LIVAC	12 Feb 2021					
		S Int	$\sim$	7 -			
	Systems		1111				
Elect	Electronics & Telecomm Department			Information Technology Department			
1.	Conducted Guest Lecture	6 <sup>th</sup> Feb 2021	1.	Conducted Guest Lecture on	6 <sup>th</sup> Feb 2021		
	on Upcoming MSBTE W-			Upcoming MSBTE W-2020			
	2020 Online Examination		1	Online Examination			
Floatrical Engineering Department			Science and Humanity Department				
1	Conducted EDP on Pocont	1 <sup>st</sup> Eab 2021 to		Conducted Guest Lecture on	$22^{nd}$ Eab 2021		
1.	Trends in Peneweble	1 100 2021 10	1. 0	Uncoming MSBTE W-2020	22 1.60 2021		
	Eporgy Sources	6 <sup>th</sup> Feb 2021	1	Online Examination			
2	Conducted Guest Lecture	6 <sup>th</sup> Eab 2021	2		27 <sup>th</sup> Eab 2021		
۷.	on Uncoming MSBTF W-	0 Feb 2021	۷.	मराठा भाषा गारव दिवस	27 Feb 2021		
	2020 Online Examination						
			3.	Conducted Lecture on	27 <sup>th</sup> Feb 2021		
				Implementation of Mentor			
				Scheme	aoth El 1 acat		
			4.	Science Day Celebration	28 <sup>ee</sup> Feb 2021		
			5.	Webinar on Importance of	28 <sup>th</sup> Feb 2021		
				Chemistry in Real life	/		



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## **Mechanical Engg. Department**

 Attended Acreserve 2020-2021 (30<sup>th</sup> Jan 2021)



ISHRAE Nashik Student Chapter had organized Webinar on Green Gas R32/R410 Benefit and Gas Charging and Troubleshooting of Inverter Units for **ISHRAE** Student Chapter Member students as well as for All ISHRAE Member. It was delivered by Mr. Anil Igale, (Subject Expert in HVAC &R Service) and Mr. Ritesh Rawal (Subject Expert in HVAC & R Service). It was coordinated by Prof. K. V. Kushare.

 Conducted Online Quiz on Refrigeration and Air Conditioning (9<sup>th</sup> Feb 2021)



Online Quiz on Refrigeration and Air Conditioning had organized for Third Year Students and Faculties by ISHRAE RSMP Student Chapter ISHRAE RSMP Student Chapter of Mechanical Engg. Dept. It was coordinated by Prof. K. V. Kushare.

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination (12<sup>th</sup> Feb 2021)

Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination had organized for SYME and TYME students. The session conducted by Prof. B. S. Deshmuksh. The event was coordinated by Prof. C. P. Gaikwad and Prof. Y. R. Kodhilkar.





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## Conducted Guest Lecture on Fluid Piping in HVAC Systems (12<sup>th</sup> Feb 2021)



Online Guest Lecture on Fluid Piping in HVAC Systems had organized by Mech. Engg. Dept. for ISHARE Student members, Third Year students of ME and Staff. Mr. Suresh Didmishe, Blue Planet Ecotech Pvt. Ltd, Nashik delivered Lecture. Mr. K. V. Kushare coordinated the event.

## **Computer Department**

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination (8<sup>th</sup> Feb 2021)



Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination was organized for SYCM and TYCM students. The session conducted by Prof. P. D. Boraste. The event was coordinated by Prof. G. N. Handge for SYCM and Prof. S. V. Sarode for TYCM.

### **E & TC Engineering Department**

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination
(6<sup>th</sup> Feb 2021)

Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination had organized for SYEJ and TYEJ students. The session conducted by Prof. S. N. Shelke. The event was coordinated by Prof. S. A. Suryawanshi.

## **Information Technology Department**

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination (6<sup>th</sup> Feb 2021)



Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination had organized for SYIF and TYIF students. The session conducted by Prof. V. K. Khedkar. The event was coordinated by Prof. S. S. Tile.



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### **Electrical Engineering Department**

Conducted State Level FDP on Recent Trends in Renewable Energy Sources, in association with ISTE and ISHRAE (1<sup>st</sup> Feb 2021 to 6<sup>th</sup> Feb 2021)



Electrical Engg Department had organized One Week Online State Level Faculty Development Program Recent Trends in Renewable Energy Sources in association with ISTE and ISHRAE. Faculty and staff members of RSM Polytechnic and Research Scholar attended it. E-certificates were provided to all the participants after successful completion of online test and feedback had taken.

## Day 1 (1<sup>st</sup> Feb 2021)



Dr. Omprakash Kulkarni (Accomplished Scientist, Mentor, Advisor, Technology Provider & Consulting Engineer in Automation, Instrumentation, Energy Management, IPR, CDM & Renewable **Energy, Certified SPACE AMBASSADOR:** National Space Society, USA) had delivered Keynote Speaker for FDP. Dr. N. S. Patil (Education Officer, MVP Samaj, Nashik) was Chief Guest for FDP. Dr. P. K. Desai (President, ISTE, New Delhi) and Mr. Subodh Murkewar (President, ISHRAE Nashik Chapter) were the guests of program. FDP was Guided by Dr. D. B. Uphade, Principal, **MVPS's** RSM Polytechnic, Nashik.



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### • Day 2 (2<sup>nd</sup> Feb 2021)



Dr. Mangesh S. Thakare (Department of Electrical Engineering, PVG's COET, Pune had delivered session on Photovoltaic Thermal Renewable Cogeneration Systems.

#### Day 4 (4<sup>th</sup> Feb 2021)



**Prof. J. P. Shah (ME Control System) had delivered session on Smart Grid.** 



Prof. Dr. P. C. Tapre (Ph. D, Electrical Engineering) Associate Professor & HOD, Elect. Engg. Dept. SND COE & RC, Yeola, Nashik had delivered session on Novel Methods of Power Generation.



Prof. O. N. Buwa (ME Control System) had delivered session on Electricity Markets: Challenges and opportunities.



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• Day 6 (6<sup>th</sup> Feb 2021)



Prof. S. S. Aher, EE Dept., MVPS's RSM Polytechnic, Nashik had delivered session on Renewable Energy Sources Integration & Utilization.

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination (6<sup>th</sup> Feb 2021)



Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination had organized for SYEE and TYEE students. The session conducted by Prof. P. R. Gangurde. The event was coordinated by Prof. S. S. Aher.

## **Science and Humanity Department**

 Conducted Guest Lecture on Upcoming MSBTE W-2020 Online Examination (22<sup>nd</sup> Feb 2021)

Online Guest Lecture on Upcoming MSBTE W-2020 Online Examination had organized for FYME, FYCM, FYEJ, FYIF and FYEE students. The session conducted by Prof. T. K. Thange. The event was coordinated by Prof. A. A. Mogal.

## मराठी भाषा गौरव दिवस उत्साहात साजरा

(27<sup>th</sup> Feb 2021)

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	ाषहा लेखन स्पत्ना	
	इत्यनेटचा तरुणावर होणारा। परिणाम	
	आजच्या जमात जिन्ने अर्व कारी पत्र पत्र कि	
	साहे आजाल नेजनाकिय भारत के सामना देका पिलक्षेत्र	
	नाम् गामल गटवरावाठा साइट हा साइचा जाता हो। त्रारत	
	विमिला आहे. इटरलेटने लिश्चिम प्रत्यकाच्या अविनावर	-
0	परिणाम कला आह, आणि हे इंटरनेट लोकसखेसाही	
	माठे प्रमाण तरुणावर वनवर्षे आहे. सोबाल नेरवरकिंश	-
	साइट/एप चा उधारस वापर केल्याने त्यकती बसक साली	-
	आहेत अशाप्रकारे आजचे तरुण त्याच कप्रामको	
	त्यात्रन आहेत सीहाल नेवन किया हे एक प्राणकार करने	
	प्यस्ता जाहत. स्ताबाता गहवरामा गह एक साहवास साह	
	उमाहार जामहा आपल जान, अनुभव आणि दुक्य प्रसारत	
	करु बाकता आम्हा एकतर याचा अरवापर करू शक्तो	
	किंवा चाग्रव्या आयुष्यासाठी त्याचा वापर करू झकती	1
	स्तवं आपल्यावर अवलंबन आहे, आणि निवड आपली	-
	आहे या तेरवरकिंग आहरकाा आ पिश्तील तकणांची	1
	मालगिवना स्टबन शहिन	
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	माजचा तरुण स्व उक्दशान तर्रजानाचावापर	
1	करण्यात पार्वात आहे. सामान्य आणि आवश्यक वापर	
	ट्यफ्तीत्व यंगस्टरला आता डायमेमिक इटरनेट सेवे	-
	रावे कतेवर केलेले मॅझेरस सोडण्यात सहचण येत	-
	भारे बनाउ के नकाण का मनातर कहरा होत आहेत.	-
	שוני ביוע איז	
	सतत साम्रभर जानलाइन जम खत्वण एकलल्या न जलए	
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Y		

MVPS's Rajarshi Shahu Maharaj Polytechnic was celebrated मराठी भाषा गौरव

दिवस on the occasion of the Birth Anniversary of eminent Marathi Poet, Vishnu Vaman Shirwadkar. It was organized by Science and Humanities Department. On the occasion department organized Essay and Poem Writing competition. This event coordinated by Prof. A. A. Mogal.



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 Conducted Lecture on Implementation of Mentor Scheme (27<sup>th</sup> Feb 2021)

# **MENTOR BOOK**



Department of Science and Humanity had organized Lecture on Implementation of Mentor Scheme for faculties. The session was conducted by Prof. Y. M. Halde and Prof. T. K. Thange. The event was coordinated by Prof. S. P. Jagtap.

## Celebrated Science Day (28<sup>th</sup> Feb 2021)





**MVPS's** Shahu Rajarshi Maharaj Polytechnic was celebrated Science Day on the occasion of the discovery of the Raman Effect by Indian physicist Sir C. V. Raman. Science and Humanity department had organized online Event on Science Day. The Program was followed by Quiz competition conducted by Prof. P. V. Patil. Poster making Competition conducted by Prof. D. B. Mogal.



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Attended Webinar on Importance of Chemistry in Real life (28<sup>th</sup> Feb 2021)



The Webinar on Importance of Chemistry in Real Life was attended by Prof. P. V. Patil, Science & Humanity Department. Webinar was organized On the occasion of National Science Day by Indian Institute of Science, Banglore. It was delivered by **Prof. Vinod Singh.** 

#### **RSM in News:**



#### सकाळ वृत्तसेवा

नाशिक, ता. ८ : मविप्र संस्थेच्या राजर्षी शाह महाराज तंत्रनिकेतनमध्ये आयएसटीई दिल्ली व इशरे नाशिक शाखेतफें ऑनलाइन माप्राहिक पाध्यापक कौशल्य विकास कार्यकम झाला या कार्यकमात राज्य व राज्याबाहेरील समारे चारशे प्राध्यापकांनी सहभाग नोंदविला कोरोनाच्या

झाले असताना, मविप्र राजर्षी

रिसेंट ट्रेंडन्स इन रिन्युएबल एनर्जी

सोसेंस या विषयावर विद्युत

विभागाने साप्ताहिक प्राध्यापक

कौशल्य विकास कार्यक्रम घेतला.

१ फेबवारीला मविप्र संस्थेचे

शिक्षणाधिकारी डॉ. एन. एस.

पाटील यांनी रिन्युएबल एनर्जीचा

योग्य वापर करण्याचे सुचविले,

तर प्रा. डॉ. ओमप्रकाश कुलकर्णी

करून तंत्रनिकेतनकरिता

तंत्रनिकेतनमध्ये

महाराज

शाह

झाले. नवनवीन उदघाटन अत्याधनिक तंत्रज्ञानाचा वापर करून विद्युत क्षेत्रात झालेल्या प्रगतीबहल व साप्ताहिक प्राध्यापक कौशल्य विकास कार्यक्रमात मार्गदर्शकांनी घेतलेल्या विषयांचा आढावा घेतला

उपकमात केबीटी अभियांत्रिकी महाविद्यालयाचे प्रा. पी. व्ही. जोशी यांनी इलेक्ट्रिक व्हेईकल आणि सोलर एनर्जी यावर मार्गदर्शन प्रादर्भावामुळे जनजीवन विस्कळित केले. दुसऱ्या दिवशी आयआयटी पवई येथील पीएच.डी.धारक डॉ. एम. एस. ठाकरे यांनी पी व्ही थर्मल रिन्युएबल को-जनरेशन या विषयावर मार्गदर्शन केले. तिसऱ्या दिवशी प्रा. डॉ. पी. सी. टाप्रे यांनी मेथड ऑफ पॉवर जनरेशन विषयावर मार्गदर्शन केले चौथ्या दिवशी प्रा. जे. पी. शहा यांनी कंट्रोल सिस्टीम ॲन्ड स्मार्ट ग्रीड विषयावर सहभागींशी

संवाद साधला, पाचव्या दिवशी प्रा.

यांच्या हस्ते ऑनलाइन कार्यक्रमाचे मार्केट चॅलेंजेस ॲन्ड अपॉर्च्युनिटी विषयाची माहिती दिली. सहाव्या दिवशी मविप्र राजर्षी शाह महाराज तंत्रनिकेतनचे प्रा. एस. एस. आहेर यांनी रिन्युएबल एनर्जी सोसेंस इंटिग्रेशन ॲन्ड युटिलिझशन विषयावर मार्गदर्शन केले.

तंत्रनिकेतनचे प्राचार्य डॉ. डी बी. उफाडे यांच्या मार्गदर्शनाखाली वेगवेगळ्या उपक्रमांचे आयोजन केले जाते. त्यात विद्यार्थ्यांबरोबर प्राध्यापकांचाही विकास होत आहे. कार्यक्रमाचे आयोजन विद्यत विभागप्रमुख पी. आर. गांगुर्डे यांनी केले. त्यांना सहकारी प्रा. पी. ए शिंदे, प्रा. ए. एस. पारखे, प्रा. एस एस. आहेर, आर. ई. आहिरे, एस. एस संगमनेरे यांचे सहकार्य लाभले उपक्रमासाठी मविप्र संस्थेच्या सरचिटणीस श्रीमती नोलिमाता पवार यांच्यासह सभापती समितीच स्थानिक व्यवस्थापन बोरस्ते अध्यक्ष माणिकराव सर्व पदाधिकारी व संचालकांनी ओ. एन. बुवा यांनी इलेक्ट्रिसिटी अभिनंदन केले.

Sakal Dt.: 08.02.2021 Page No.: 2

## **Trending Technology:**

#### Nano Electromechanical System

1. Introduction The nano electromechanical system integrates nano-size electronics elements with mechanical machines to form physical and chemical sensors. NEMSs provide three main

advantages as mechanical biosensors in surgery. First, they can achieve mass resolution at the nanogram scale when operating in a fluid environment, as the minimum detectable mass added is proportional to the total mass of the device. Second, the ability of an NEMS device to be displaced or deformed known as mechanical compliance increases with uniform reduction of its dimensions. This high degree of



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mechanical compliance allows an applied force to be translated into a measurable displacement, such that even the miniscule forces governing cellular and subcellular interactions can be quantified. For example, NEMS sensors can resolve forces as small as 10 pN, making them sensitive enough to detect the breaking of hydrogen bonds. Third, small fluidic mechanical devices can exhibit fast response times, which would facilitate real-time monitoring of biological processes. They form the logical next miniaturization step from socalled micro electromechanical systems. They have incredible properties, which pave the way to various ultrahigh-frequency applications, ranging from resonators to chemical and biological sensors.

# New developments in the Nano Electromechanical System

Micro-and Nanoelectromechanical systems (MEMS and NEMS) technology is one field in which modeling and simulation methods are of central importance for the design of highly integrated systems. These can involve many types of model, including classical physical models, continuum mechanics models (e.g. for investigation of elasto-dynamic effects), thermal models, magnetic models and electrical models. Computational studies may involve not only threedimensional finite element analysis, but also atomicscale descriptions of materials using molecular dynamics simulation methods. For many practical applications, there is therefore a need to reduce the computational complexity by reducing the number of variables and parameters in the model. This is especially important in applications involving the application of feedback principles where control design techniques have to be applied. In such cases, the use of model reduction methods becomes essential.

Issues such as the effects of thermal fluctuations on NEMS device performance leads to situations where physically based models are again essential and there is therefore a need to be able to move efficiently from highly detailed, physically based models to reduced models for control system design and then back to physically based models for further analysis. The capability to model effectively at a number of different resolutions is therefore vitally important and two of multi-scale simulation model are categories recognized in this application area. The first of these involves sequential multi-scale modeling methods, in which large-scale models (such as those used for control system design) use low-resolution representations derived from more detailed, physically based, higherresolution descriptions. The simulations at these different levels run independently of each other. The second approach is termed concurrent multiscale *modeling* and attempts to link methods together in a combined model in which the different scales are considered concurrently. Developments of this kind are clearly applicable in other fields and have considerable relevance for all involved in the use of simulation techniques in designing highly integrated systems, whatever the area of application.



#### Fig. 1 Nano Electromechanical System

Nano electromechanical systems (NEMSs) are devices that integrate electrical and mechanical functions at the Nano scale. They consist of miniaturized electrical and mechanical apparatuses such as actuators, beams, sensors, pumps, resonators, and motors. These components convert one form of energy into another, which can be quickly and conveniently measured. These devices can function as biosensors to monitor important physiological variables during surgical procedures, such as intracranial pressure, cerebrospinal fluid (CSF) pulsatility, weight load, and strain.

#### Mr. D. U. Chaudhari TA, ME

#### Machine learning



#### Machine learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns

and make decisions with minimal human intervention. While machine learning is based on the idea that machines should be able to learn and adapt through experience, AI refers to a broader idea where machines can execute tasks "smartly." Artificial Intelligence applies machine learning, deep learning and other techniques to solve actual problems.



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Every machine-learning algorithm has three components: Representation: how to represent knowledge. Examples include decision trees, sets of rules, instances, graphical models, neural networks, support vector machines, model ensembles and others. Machine learning, or ML, is an application of AI that provides computer systems with the ability to automatically learn and improve from experience without being explicitly programmed. ML focuses on the development of algorithms that can analyse data and make predictions. Python is the leader, with 57% of data scientists and machine learning developers using it and 33% preferring it over other languages for developments. Not only python is a widely-used language, but it is the primary choice for most of its users due to the release of Tensor Flow and a wide selection of other libraries.

**Description:** While machine learning is based on the idea that machines should be able to learn and adapt through experience, AI refers to a broader idea where machines can execute task smartly. Artificial Intelligence applies machine learning, deep learning and other techniques to solve actual problems.

**About:** There are perhaps 14 types of learning that you must be familiar with as a machine-learning practitioner; they are:

#### **Learning Problems**

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

#### **Hybrid Learning Problems**

- Semi-Supervised Learning
- Self-Supervised Learning
- Multi-Instance Learning

#### **Statistical Inference**

- Inductive Learning
- Deductive Inference
- Transductive Learning

#### **Learning Techniques**

- Multi-Task Learning
- Active Learning
- Online Learning
- Transfer Learning
- Ensemble Learning



Fig. 2 Machine Learning Algorithm

Other than that AI will be used further to analyse interactions to determine underlying connections and insights, to help predict demand for services like hospitals enabling authorities to make better decisions about resource utilization, and to detect the changing patterns of customer behaviour by analysing data in near real-time, driving revenues and enhancing personalized experiences.

#### **Conclusion:**

Artificial Intelligence and Machine Learning are products of both science and myth. The idea that machines could think and perform tasks just as humans do is thousands of years old. ... But the potential of AI and machine intelligence for good does not lie exclusively, or even primarily, within its technologies.



Fig. 3 Machine Learning

Machine Learning can be a Supervised or Unsupervised. If you have lesser amount of data and clearly labelled data for training, opt for Supervised Learning. Unsupervised Learning would generally give



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better performance and results for large data sets. If you have a huge data set easily available, go for deep learning techniques. You also have learned Reinforcement Learning and Deep Reinforcement Learning. You now know what Neural Networks are, their applications and limitations.

#### Mast. Vaibhav Shingote Student, TYME

Starlink is a satellite internet company developed by



SpaceX as a revenue-generating business to fund SpaceX's plans to colonize Mars. Starlink satellites are in low-Earth orbit, which is much closer than satellite providers generally use.

This could enable Starlink to deliver lower latency than you can usually get with satellite service.

As of February 2021, Starlink has launched over 1,000 satellites.9,11 But that doesn't mean that Starlink is ready to offer full-fledged satellite internet service yet. Starlink will need to have up to 42,000 satellites in its constellation—which means it's still a long road ahead for Starlink. Thus far, only 12,000 Starlink satellites have been approved by both the FCC (Federal Communications Commission) and the ITU (International Telecommunication Union).

Because Starlink's satellite constellation is not fully filled out, beta testers experience periodic outages. As more satellites are launched, Starlink expects that outages will eventually not be a problem.

In private beta test results, Starlink has shown it can deliver a high-speed satellite internet connection of 100 Mbps or more with an extremely low latency of 20 milliseconds.1,2,3 Starlink tells customers to expect speed variations between 50 to 150 Mbps in the beta testing phase.

Currently, signing up to test Starlink during the beta costs \$99 per month, plus an initial \$499 equipment cost required at sign up.7 There's no word so far on how much Starlink will cost once it's fully launched (although we expect it could be higher). The one-time equipment fee of \$499 includes the Starlink dish receiver (what Elon Musk calls "a UFO on a stick"), a mounting tripod, and a Starlink modem.

To join the waitlist for the Starlink beta, you have to go to Starlink's main website and enter your address and email, and then wait for an invitation.

#### How Starlink is different?

Thanks to reusable launch rockets, Starlink's low-orbit satellites cost a fraction of the price of typical satellite launches, making it easier and more affordable to launch satellites at scale. By mid-2020, Starlink hit a steady stride, producing and launching around 120 satellites per month. Initially, the constellation is being built out more heavily in some areas, so service will be available in the northern United States and lower Canada first.

Within the next few years, Starlink expects to offer satellite internet to the entire planet, including remote locations where internet isn't currently available. The plan involves launching a vast constellation of massproduced satellites into low-altitude orbit. The satellites will transmit internet signals to Earth-based hubs, delivering superfast connection speeds.For now, Starlink service is designed for stationary use, tied to a specific service address (although there have been some successful Starlink tests in the wild). But Elon Musk has said that eventually, he plans to make Starlink portable and usable in-motion, so customers can take their receiver anywhere and receive service.8 This would allow Starlink to provide internet service to individual customers in RVs, but also to trains, planes, buses, and ships.How much will Starlink internet cost?During the current public beta, Starlink internet costs \$99 per month. There are no pricing details on how much Starlink will cost after the beta. But the biggest sticker shock for would-be-Starlink-testers is the equipment cost. You have to invest \$499 up front for a Starlink satellite dish, modem, and other required hardware. Ouch, right? We can't help but wonder what will happen if/when this equipment gets redesigned (will eBay get slammed with vintage Starlink satellite dishes?)So, even though low-income, underserved, and rural parts of the world could benefit most from Starlink, the cost is a big deterrent for those who need it most. 10% of the world's population live in extreme poverty, which is defined by the UN as living on less than US\$1.90 per day, per person. Starlink's high equipment cost places the service far above the reach of millions around the world who could benefit from internet access. To be fair, Starlink is aware of the high equipment cost. On November 2, 2020, Elon Musk tweeted, "Lowering terminal equipment cost. . . is actually our most difficult technical challenge." We hope he finds a solution to this issue.

#### How Starlink works?

Images of the Starlink satellite constellation look like a fishing net, where thousands of dots are the satellites that rotate in synchronized orbits so that all areas of the



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globe have satellite coverage. The Starlink satellite network covers the whole globe, although initially certain parts of the constellation will be more fully built out. Satellites will eventually communicate with each other via lasers, which reduces lag time and enables a speedier connection with less latency (the two main complaints with satellite internet).

Starlink satellites are in a much lower orbit than other satellites are in. Starlink is the first satellite internet provider to utilize low Earth orbit, targeting all satellites to orbit between 540 km to 570 km above the Earth's surface. Low flying satellites can transmit data more quickly and offer much lower latency (or lag time). Where to get nationwide satellite internet now

Starlink is still in its early stages as a satellite provider and isn't available everywhere yet. If you need a satellite connection now, Viasat and HughesNet offer satellite coverage at a good price in all 50 states. It might not be as fast as the futuristic satellite service you'll someday get from Starlink, but it'll keep you connected and up on the latest news with its massive coverage area. You can read more about Viasat, HughesNet, and the best rural internet options on our site.

> Mast. Pethkar Akshay Student, TYCM

#### What is Digital Security?



We live in a time when much of our lives, personal and professional, reside online. We do our banking, music purchases, bill paying, social planning, and even parts of our job, in the digital world. This increased

reliance on the internet and digital networks brings risks along with the convenience it provides.

Online criminals, hackers, even just bored mischiefmakers lurk in the shadows, waiting to rob you, commit fraud, steal your identity, or simply embarrass you. Therefore, digital information security is of paramount concern.

#### What is Digital Security?

Digital security is the collective term that describes the resources employed to protect your online identity, data, and other assets. These tools include web services, antivirus software, smartphone SIM cards, biometrics, and secured personal devices.

In other words, digital security is the process used to protect your online identity.

# What is the Difference Between Digital Information Security and Cyber Security?

You may have heard the term "cyber security" bandied about. That's hardly surprising since illegally accessing someone's data, identity, or financial resources is called a "cybercrime," which in turn creates a need for cyber security.

Yet, there's a difference between digital security and cyber security. Digital security involves protecting your online presence (data, identity, assets). At the same time, cyber security covers more ground, protecting entire networks, computer systems, and other digital components, and the data stored within from unauthorized access.

You could make a case for calling digital security a sub-type of cyber security. Many industry professionals use the two terms interchangeably, but in reality, digital security protects information, and cyber security protects the infrastructure, all systems, networks, and information.

#### Why is Digital Data Security Important?

Cybercriminals are opportunists attracted by the sheer volume, value, and variety of data available for exploitation. And all they need is just one good haul to make their efforts worth it. If they can fool only one consumer through a phishing attack, for examplehackers could reap the rewards of a stolen identity or a compromised credit card with a substantial balance to burn through.

Like we said at the start, our increased reliance on the internet means we have a lot more to lose if something goes sideways. The stakes are raised; we need impeccable, reliable digital data security.

# What Kind of Information is considered a Digital Security Risk?

Not every bit (or byte) of your information is useful to cybercriminals. A total stranger finding out that you prefer the original Star Wars trilogy to the sequels is scarcely an earth-shattering revelation that could compromise your identity or financial security. So, what kinds of data are at risk?

**Personal Identification Data** This data includes your name, phone number, address, email account name, IP address, and, most damaging, your Social Security number. It also includes information that potentially pinpoints your location. Personal data is often used for identity theft and social engineering. Also, a hacker who has your Social Security number (or equivalent) can open credit card accounts in your name, thereby eventually destroying your credit score.



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Sunsaluter

#### • Personal Payment Data

If it has to do with financial transactions, it's considered personal payment data. This information includes credit and debit card numbers (including expiration dates), online banking numbers (account and routing), and PIN codes. Criminals who gain access to your online banking information can even transfer funds out of the accounts or make purchases.

#### • Personal Health Data

Also known as personal health information (PHI), this data type encompasses information on your health, including medical history, prescription drugs, health insurance subscriptions, and doctor and hospital visits. This information is precious to high-rolling cybercriminals since they can use your health information to file false insurance claims or order and resell prescription drugs.

#### -Prof. G. N. Handge LCM

#### **Embedded Web Technology**



Google Glass, or simply Glass, is a brand of smart glasses an optical head-mounted display designed in the shape of a pair of glasses. It was developed by X (previously Google X) with the mission of producing a ubiquitous computer. Google Glass

displays information in a smartphone-like, hands-free format. Wearers communicate with the Internet via natural language voice commands.

#### Features:

Touchpad: A touchpad is located on the side of Google Glass, allowing users to control the device by swiping through a timeline-like interface displayed on the screen. Sliding backward shows current events, such as weather, and sliding forward shows past events, such as phone calls, photos, circle updates, etc.

Camera: Google Glass has the ability to take 5 MP photos and record 720p HD Video. Glass Enterprise Edition 2 has an improved 8MP 80° FOV camera.

Display: The Explorer version of Google Glass uses a liquid crystal on silicon (based on an LCoS chip From Himax), field-sequential color system, LED illuminated display. The display's LED illumination is first P-polarized and then shines through the in-coupling polarizing beam splitter (PBS) to the LCoS panel. The panel reflects the light and alters it to S-polarization at active pixel sensor sites. The incoupling PBS then reflects the S-polarized areas of light at 45° through the out-coupling beam splitter to

a collimating reflector at the other end. Finally, the outcoupling beam splitter (which is a partially reflecting mirror, not a polarizing beam splitter) reflects the collimated light another 45° and into the wearer's eye.

# Prof. S. A. Suryawanshi, LEJ

The SunSaluter is a dual-incentive passive solar tracking and water filtration system, which optimizes existing solar infrastructure by collecting up to 40% more energy and simultaneously providing clean

drinking water. Solar tracking is achieved through balancing the weight on both ends of the solar panel. Controlled water flow adapts the balance of the solar panel, which is secured on a bamboo frame with a rotatable axis, to the direction of the solar radiation. The system is suitable for areas with near zenith angles of the sun, such as tropical and subtropical regions. The Sun Saluter does not require electricity and can be manufactured from local materials for less than 40 USD.

As an add-on to the system, a filter unit constructed from either silver-coated ceramic or biosand is placed below the water container. Both ceramic and biosand filters trap up to 99.9% of contaminants and microorganisms in the filter pore (according to entrants)

Access to clean drinking water and electricity are important cornerstones in basic supply. Converting solar energy to electricity offers many benefits in terms of efficiency and sustainability, especially in areas with much sunlight and poor infrastructure regarding central power supply. One major deficiency of the panels currently in use is that they are installed statically and cannot follow the course of the sun. Although electric motors exist which can rotate the panels towards the sunlight, they require electricity, a high degree of maintenance and are expensive to install.

#### Mast. Manoj Jagtap Student TYEJ

#### Virtual Reality



In recent years, Virtual Reality technology is a new useful technology, which is active in the field of computer technology. Virtual Reality (VR) is a computergenerated environment with scenes and objects that appear to be real,

making the user feel they are immersed in their surroundings. This environment is perceived through a



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device known as a Virtual Reality headset or helmet. VR allows us to immerse ourselves in video games as if we were one of the characters, learn how to perform heart surgery or improve the quality of sports training to maximise performance.

Virtual Reality and Augmented Reality are two sides of the same coin. You could think of Augmented Reality as VR with one foot in the real world: Augmented Reality simulates artificial objects in the real environment; Virtual Reality creates an artificial environment to inhabit. In Augmented Reality, the computer uses sensors and algorithms to determine the position and orientation of a camera.

In Virtual Reality, the computer uses similar sensors and math. However, rather than locating a real camera within a physical environment, the position of the user's eyes are located within the simulated environment. If the user's head turns, the graphics react accordingly. Rather than compositing virtual objects and a real scene, VR technology creates a convincing, interactive world for the user.

The advantages of virtual reality technology used in distance teaching-In traditional distance teaching, the restrictions of laboratory equipment, laboratory space, teaching resources and other reasons lead to some teaching experiments which cannot be opened. Using Virtual Reality technology can compensate for these deficiencies, so that learners, staying at home, can do all sorts of experiments, get the same experience with the real experiment, rich perceptual, deepen the understanding of course content, and can avoid a variety of risks caused by the real experiment or operation. Learners can safely do a variety of dangerous or harmful experiments in a virtual experiment system. For example: in the chemical experiments, using Virtual Reality lab can avoid risks of toxic gases, combustion, explosion produced by chemical reaction.

Completely Break Time and Space Constraints -Everyone can get the required teaching resources through the virtual network so that resources are fully utilized. Educational resources are no longer spread due to the limits of geography and space, this new form of distribution so that all learners can enjoy equal and timely access to quality education. Learning resources means all elements which can be used by learners in the learning process. In traditional distance teaching, remote teachers provide information content to learners only through the printed material or broadcast TV, so learners only passively accept the teaching information in the learning process, lack of timely feedback and interaction. At present, under the guidance of the concept of advanced education, educational emphasis on improving learner learning initiative, Virtual Reality

technology provides a wealth of learning resources for learners to independently explore learning.

Prof. R. S. More LIF

#### **Edge Computing**



Edge computing is a distributed, open IT architecture that features decentralized processing power, enabling mobile computing and Internet of Things (IoT) technologies. In edge computing, data is processed

by the device itself or by a local computer or server, rather than being transmitted to a data centre.

The origins of edge computing lie in content delivery networks that were created in the late 1990s to serve web and video content from edge servers that were deployed close to users. In the early 2000s, these networks evolved to host applications and application components at the edge servers, resulting in the first commercial edge computing services that hosted applications such as dealer locators, shopping carts, real-time data aggregators, and ad insertion engines. Modern edge computing significantly extends this approach through virtualization technology that makes it easier to deploy and run a wider range of applications on the edge servers.

The increase of <u>IoT</u> devices at the edge of the network is producing a massive amount of data to be computed at data centers, pushing network bandwidth requirements to the limit. Furthermore, devices at the edge constantly consume data coming from the cloud, forcing companies to build content delivery networks to decentralize data and service provisioning, leveraging physical proximity to the end user.

The distributed nature of this paradigm introduces a shift in security schemes used in cloud computing. In edge computing, data may travel between different distributed nodes connected through the Internet, and thus requires special encryption mechanisms independent of the cloud. Edge nodes may also be resource constrained devices, limiting the choice in terms of security methods.

Edge application services reduce the volumes of data that must be moved, the consequent traffic, and the distance that data must travel. That provides lower latency and reduces transmission costs. Computation offloading for real-time applications, such as facial recognition algorithms, showed considerable improvements in response times, as demonstrated in early research.

In a similar way, the aim of Edge Computing is to move the computation away from data centers



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towards the edge of the network, exploiting smart objects, mobile phones or network gateways to perform tasks and provide services on behalf of the cloud. By moving services to the edge, it is possible to provide content caching, service delivery, storage and IoT management resulting in better response times and transfer rates.

#### Ms. Anjali Bhamare Student SYIF

Implementation of HVDC for Power System Interconnection



Modern power systems have an everincreasing power demand; an increase in power supply must answer this increase in demand. One method to increase the reliable supply of power requires the interconnection of

multiple power systems. The main problems associated with the interconnection of multiple electrical networks include the need for the synchronization between networks, losses associated with long transmission lines, increase in the short circuit current, and a possible reduction in network stability. The implementation of high voltage direct current (HVDC) transmission systems is a possible solution to such limitations, resulting in a higher capacity, more reliable, and a more efficient power system. A preamble exploring the power flow in the AC transmission systems continues with the description of the operation of the HVDC transmission link.

#### Introduction:

Power transfer is an essential part of any energy system, and the technology to transfer that power has been becoming more advanced. In general, an electrical power system consists of the generation of power, transferring the power, and distributing it to individual users electrical networks are becoming more interconnected, and power travels over longer distances to meet an increase in power demand. AC transmission systems, however, have several limitations when transferring large quantities of power over these long distances Losses are a problem in larger AC systems due to the amount of impedance longer cables have, making them prone to the voltage drop (i.e., that line impedance reduces the voltage level at the end of the line). If one chooses to ignore the resistance of the AC transmission line, then the power transfer

across is directly proportional to the magnitudes of the voltages at both ends, the sine of their phase shift angle, respectively inversely proportional to its total series inductive reactance. Moreover, the power flow through AC parallel transmission lines is inversely proportional to the line impedance, due to the mutual coupling. The lack of possibility to actively controlling the current flow can result in overloading of a portion of the transmission system, and the under loading of other parallel conductors, and finally in an uneven, suboptimal load flow which limits the maximum capacity of the transmission system An additional factor which limits the maximum power transfer through the AC transmission lines is the skin effect: most of the current conducting occurs on the conductor perimeter.



Fig: The generic configuration of an HVDC transmission system with one DC conductor

In every HVDC transmission system, there are main components included for the system to be able to convert and transfer electrical power. A line commutated HVDC transmission system consists of two AC systems connected through a pair of bi-directional converters with a conductor or two between them. One converter is a controlled rectifier converting AC power from one power system into DC voltage and current, and the other converter performs the inversion, drawing DC power from the HVDC transmission system converting it into AC power. The instantaneous power demand decides which end is a rectifier, and which is an inverter. The physical topology of a line commutated converter used in HVDC transmission consists of one, or multiple, six pulse

Bridges consisting of valves containing several series and parallel connected thyristors.

Prof. P. A. Shinde LEE

A New Two-Motor Drive to Control a Two-Phase Induction Motor and a DC Motor



A multi-motor drive, which independently controls multiple motors by a single microcontroller and converter, reduces the system cost by reducing the drive system parts count. This paper proposes direct torque control (DTC) of a two-phase



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induction motor (as the main motor) and hysteresis based current control of a permanent magnet DC motor (as the auxiliary motor) using a four-leg converter. An augmented switching table is proposed to control both motors. Analytical equations are also proposed to assess the current ripple and controllability of the DC motor.

#### Introduction:

Many industries require independent control of multiple electrical motors. Since the industry primarily shows intreset in low-cost drives, different multiple-motor drives have been used in the industry as an attempt to reduce the cost. A multiple-motor drive uses a single microcontroller and reduced number of power electronic switches and corresponding circuits to control multiple electric motors.

Different methods such as 1) series or parallel connection of motors, 2) sharing power electronic switches, 3) using the middle point of the DC link of the converter 4) connecting the neutral point of one motor to the terminal of another motor have been proposed to control multiple electric motors using a single converter. A multiple motor drive gives the same priority to the controls of all of its electric motors when the appropriate control of all electric motors is critical. However, in some other applications, the higher priority is given to the control of some electric motors that play more important roles in the system. These motors with important roles in the system are known as main motors while the motors with less important roles are known as auxiliary motors.

The previously proposed multiple-motor drives focus on the control of three- or multi-phase motors. These drives are not proposed for two-phase electric motors. Because of having a simple and robust structure, a two-phase induction motor is advantageous in low-cost variable speed motor drives. Different structures of a two-phase voltage-sourced converters (i.e., two-, three-, and fourleg converters) have been proposed to supply a two phase induction motor. Among these structures, the four leg converter provides larger voltage vectors and maximum number of generated voltage vectors. This structure shows the superior performance to control a two-phase induction motor in variable speed applications.

This article proposes independent control of a two-phase induction motor (as the main motor) and a DC motor (as the auxiliary motor) using a single four-leg converter. The induction motor is controlled via direct torque control method, and the DC motor is controlled by the current control method. DTC is a reliable and low-cost method to control the electromagnetic torque and stator flux modulus of an induction motor without a mechanical sensor, and the armature current control is a common method to control a DC motor. In DTC of an induction motor using a four leg converter, a voltage vector may be generated by different switching states. Among possible combinations, the controller selects a switching state that is also useful to control the DC motor current.

A basic two-phase DTC drive system estimates and controls the stator flux modulus  $|\lambda_s|$  and the electromagnetic torque  $T_e$  of a two-phase induction motor based on the analysis of the motor variables in the stationary (DQ) reference frame. Based on the outputs of the hysteresis controllers of  $|\lambda_s|$  and  $T_e$  and calculated stator flux sector, this drive.

What is Carbon Credits?

#### Mast. Shubham Deore Student, TYEE

#### Carbon Credit



A carbon credit is a permit that allows the company that holds it to emit a certain amount of carbon dioxide or other greenhouse gases. One credit permits the emission of a mass equal to one ton of carbon

dioxide.

The carbon credit is one half of a so-called "cap-andtrade" program. Companies that pollute are awarded credits that allow them to continue to pollute up to a certain limit. That limit is reduced periodically. Meanwhile, the company may sell any unneeded credits to another company that needs them.





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**Certified emissions reduction (CER):** Emission units (or credits) created through a regulatory framework with the purpose of offsetting a project's emissions.

#### What is meant by Kyoto Protocol?

The Kyoto Protocol is an international agreement that aimed to manage and reduce carbon dioxide emissions and greenhouse gases. The Protocol was adopted at a conference in Kyoto, Japan, in 1997 and became international law on February 16, 2005.

#### Purpose of Carbon Credits:

The ultimate purpose of carbon credits is, therefore, to reduce the emission of GHG into the atmosphere. In other words, carbon credits are exchanged in a carbon market commonly referred to as the cap-andtrade market, where businesses can sell each other's rights to pollute.



#### **CNC Machine**



In the late 1940s, John Parsons of Parsons Corp. in Traverse City, MI, developed a system to control machining equipment by feeding it punched cards with holes corresponding to coordinates. Starting

in 1949, Parsons joined the U.S. Air Force at an MIT laboratory to further develop what was to become numerical control.

CNC Machining is often the last step in metal manufacturing, or sometimes the only process involved. Compared to other metalworking techniques, CNC machining is capable of meeting the tightest tolerances, and producing the most accurate, precise products over and over again. To understand the origins of CNC Machining, it's important to break the phrase down into three parts: First, "machining," or the process of removing metal with the assistance of mechanical equipment, has been around for centuries. Machining processes include: turning, drilling, milling, shaping, broaching and grinding.



Next, "NC" stands for "Numerical Control." In traditional machining, a human operator must control the motion of a machine tool. Numerical control, first developed in the 1940s, governs the motion of machines automatically, through set instructions.

Finally, the "C" gets added. "Computer Numerical Control" designates a process by which an operator can write, adjust and implement instructions using a computer console. This addition, which took place in the 1950s, is what makes modern machining possible.

A CNC machine is a motorized maneuverable tool and often a motorized maneuverable platform, which are both controlled by a computer, according to specific input instructions. Instructions are delivered to a CNC machine in the form of a sequential program of machine control instructions such as G-code and M-code, then executed. The program can be written by a person or, far more often, generated by graphical computer-aided and/or computer design (CAD) software aided manufacturing (CAM) software. In the case of 3D printers, the part to be printed is "sliced", before the instructions (or the program) is generated. 3D printers also use G-Code.

> Mast. Rushikesh Sonawane Student, FYME



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