Maratha Vidya Prasarak Samaj's
Rajarshi Shahu Maharaj Polytechnic, Nashik
Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.
RSM POLY
Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.

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RSM POLY NEWSLETTER – JAN 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 Sarchitnis Hon. Smt. Nileematai V. Pawar Madam, All Directors and Education Officers felicitated our Principal Dr. D. B. Uphade for the 100% admission of First Year 2020-2021.**

- **MVPS's Rajarshi Shahu Maharaj Polytechnic felicitated the faculty members Prof. S. S. Tile, Prof. N. S. Mogare who successfully completed NPTEL Jun-Dec 2020 course.**

Admissions Open for First Year and Direct Second Year Diploma Engineering

मराठा विद्या प्रसारक समाजाचे

राजर्षी शाहू महाराज पॉलिटेक्निक, नाशिक

उदोजी मराठा बोर्डींग कॅम्पस, गंगापूर रोड, नाशिक-१३
फोन नं.०२५३-२३११०१८, २३११०१९

प्रथम वर्ष व थेट द्वितीय वर्ष प्रवेश

शाखा	कोड	क्षमता
मेकॅनिकल इंजिनिअरींग	524761210	60
कॉम्प्युटर टेक्नोलॉजी	524725110	60
इलेक्ट्रॉनिक्स ॲन्ड टेलीकम्युनिकेशन इंजिनिअरींग	524737210	60
इन्फॉरमेशन टेक्नोलॉजी	524724610	60
इलेक्ट्रीकल इंजिनिअरींग	524729310	60

प्रवेशासाठी पात्रता

प्रथम वर्ष	थेट द्वितिय वर्ष
* इयत्ता १० वी पास	* इ. १२ वी सायन्स, एम.सी.व्ही.सी., व्होकेशनल, टेक्निकल * आय.टी.आय. (कमीत कमी दोन वर्षाचा कालावधी)

वैशिष्ट्ये : * उच्च शिक्षित व अनुभवी प्राध्यापक वर्ग * सर्व प्रकारच्या शासकिय स्कॉलरशिप योजना लागू * नाशिक शहराच्या मध्यवर्ती ठिकाणी * सुसज्ज प्रयोगशाळा व सुसज्ज ग्रंथालय * कॅम्पस इंटरव्ह्युद्वारा नोकरी मिळविण्याची संधी.

MVP RSM Polytechnic FC

- **MVPS's RSM Polytechnic has authorised Facilitation Center for First Year and Direct Second Year Diploma Engineering Admission**

FC takes all precautions to avoid spread of Covid-19 with social distancing guided by DTE, Maharshtra.

MVP RSM Polytechnic

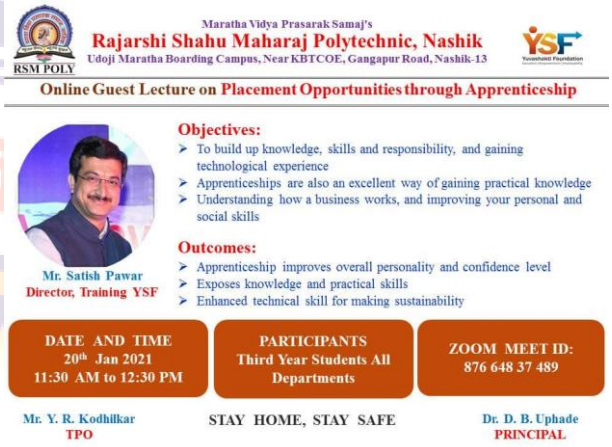
- **Celebration of Republic Day (26th Jan 2021)**

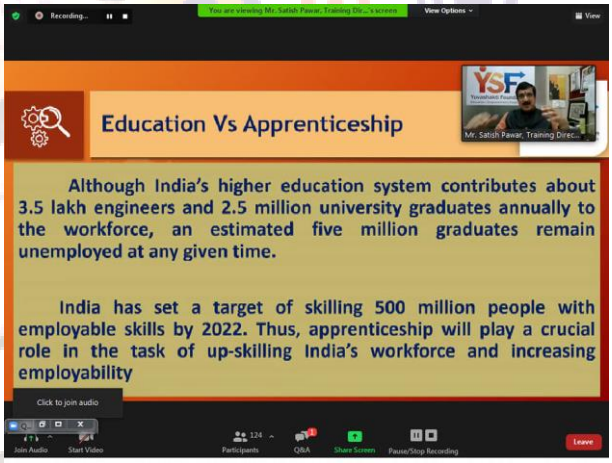
MVPS's Rajarshri Shahu Maharaj Polytechnic celebrated 72th Republic Day. Flag hosted by LMC Member Hon. Er. Ashok Gaikwad in the presence of LMC Members Hon. Damodar Gawale, Hon. Er. Sudhir Pagar and Hon. Satish Pawar.

- **MVPS's RSM Polytechnic Online Annual Alumni Meet (26th Jan 2021)**

MVPS's Rajarshri Shahu Maharaj Polytechnic was arranged 7th Alumni Meet on 26th Jan 2021.Principal Dr. D. B. Uphade adderssed the Alumni. About 95 Alumni attended the meet.

- **Conducted Guest Lecture on Placement Opportunities through Apprenticeship (20th Jan 2021)**





Online Guest Lecture on Placement Opportunities through Apprenticeship was organized for Third Year Students. It was delivered by Mr. Satish Pawar, Director, YSF, Nashik. It was coordinated by Prof. Y. R. Kodhilkar.

NEWSLETTER: JAN 2021

Mechanical Engineering Department			Computer Technology Department		
Sr #	**Activities**	**Date(s)**	**Sr #**	**Activities**	**Date(s)**
1.	Alumni Felicitation: Ms. Pooja Deshmukh	9th Jan 2021	1.	Guest Lecture on Scheduling Algorithm	15th Jan 2021
2.	Guest Lecture on Basic of Refrigeration	22nd Jan 2021	2.	Online Industrial Visit	19th Jan 2021
			3.	Training Program on Artificial Intelligence	29th Jan 2021

Electronics & Telecomm Department			Information Technology Department		
1.	Pre Alumni Meet	2nd Jan 2021		--	
2.	Alumni Felicitation:	13th Jan 2021			
2.	Online Industrial Visit	22nd Jan 2021			

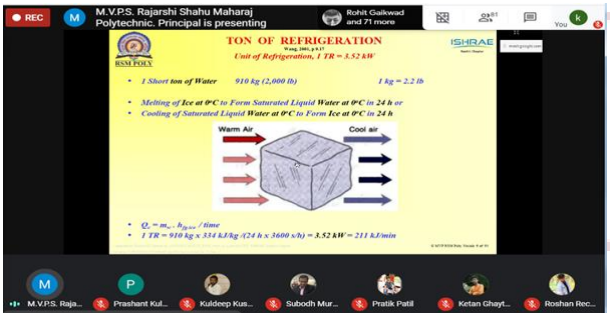
Electrical Engineering Department			Science and Humanity Department		
1.	Pre Alumni Meet	2nd Jan 2021	1.	Online Student Orientation Program 2020-21	15th -16th Jan 2021

Mechanical Engg. Department

- **Felicitation of Alumna (9th Jan 2021)**

Felicitation of Pooja Deshmukh, Alumna (Batch 2015) for joning M.S in Adv. Mech. Engg. At Coventry University, England.

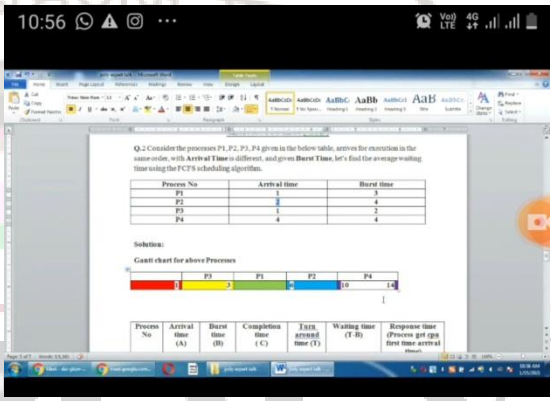
- **Conducted Guest Lecture on Basic of Refrigeration (22nd Jan 2021)**



Online Guest Lecture on Basic of Refrigeration was organized by Mech. Engg. Dept. for ISHARE Student members, Third Year students of ME, EJ, EE and Staff. It was delivered by Dr. D. B. Uphade, Principal, MVPS's RSM Polytechnic, Nashik. Mr. K. V. Kushare coordinated the event.

Computer Department

- **Conducted Guest Lecture on Scheduling Algorithm (15th Jan 2021)**



Online Guest Lecture on Scheduling Algorithm was organized by Computer Technology Dept. for Third Year students. It was delivered by Prof. Jaya Suryawanshi, Asst. Professor, MVPS's KBTCOE, Nashik. Prof. S. V. Sarode coordinated the event

- **Online Industrial Visit (19th Jan 2021)**

Online Industrial Visit was organized on Software Testing Tool for Third Year Students by Prof. P. N. Patil. It was Delivered by Ms. Priyanka Deshmukh, Quality Analysis/ Software Testing, Smart HUB Nashik.

- **Attended One Day Training Program on Artificial Intelligence(29th Jan 2021)**

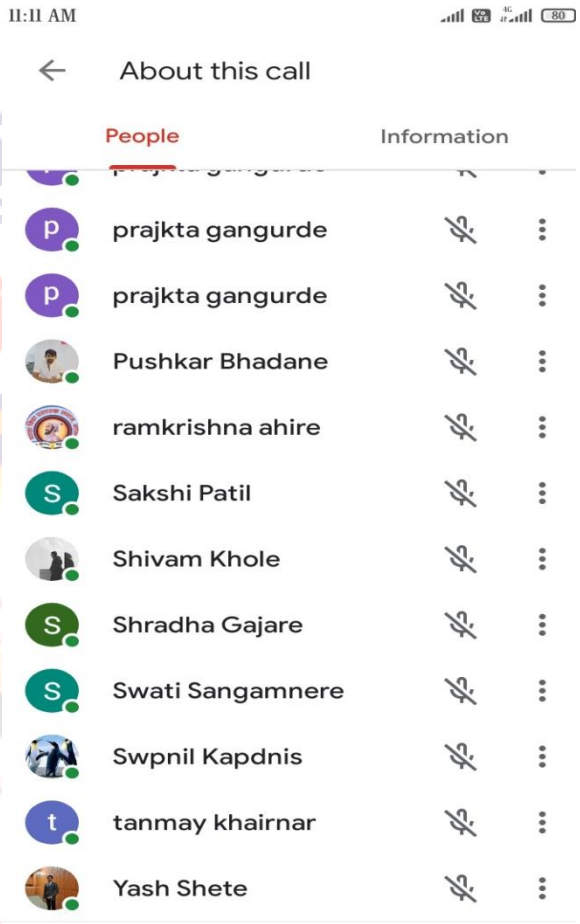
Online Tranning Program on Artificial Intelligence was attended by Third Year students of Computer Dept.

E & TC Engineering Department

- **Online Industrial Visit (22nd Jan 2021)**

Online Industrial Visit at Sivananda Electronics was organized for Second Year and Third Year Students under the subject Electronics Instruments and measurement.It was delivered by Mr. B. L. Nimbalkar. It was coordinated by Prof. S. A. Suryawanshi.

- **Conducted Pre-Alumni Meet (2nd Jan 2021)**



Online Pre-Alumni Meet was organized for all pass out students of Electronics and Telecommunication.

Information Technology Department

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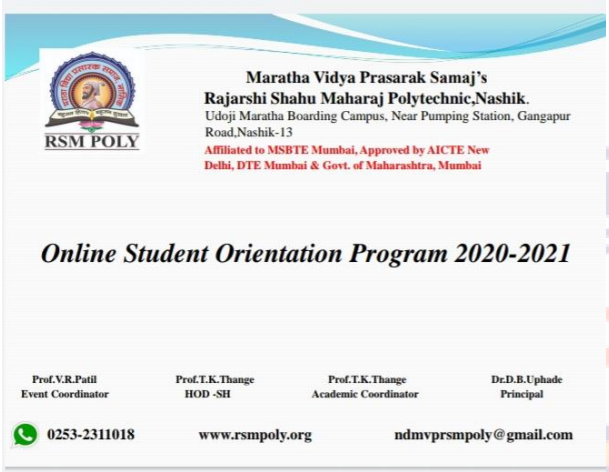
Electrical Engineering Department

- **Conducted Pre-Alumni Meet (2nd Jan 2021)**

Online Pre Alumni Meet was organized for all pass out students of Electrical Engineering Department.

Science and Humanity Department

- **Online Student Orientation Program of 2020-21 (15th -16th Jan 2021)**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Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai

Online Student Orientation Program 2020-2021

Prof.V.R.Patil, Event Coordinator | Prof.T.K.Thange, HOD -SH | Prof.T.K.Thange, Academic Coordinator | Dr.D.B.Uphade, Principal

0253-2311018 www.rsmpoly.org ndmvprsmpoly@gmail.com

Conducted Online Student Orientation Program for All Newly Admitted Student of First Year and Direct Second Year 2020-21.

RSM in News:

नाशिक : कोरोना पार्श्वभूमीवर महाविद्यालयाच्या प्रवेशद्वारावर विद्यार्थ्यांचे शारीरिक तापमान मोजताना कर्मचारी.

मविप्र पॉलिटेक्निकला प्रथम क्रमांकाची पसंती

नाशिक : पुढारी वृत्तसेवा

मविप्र समाज संचलित राजर्षी शाहू महाराज पॉलिटेक्निकमध्ये शैक्षणिक वर्ष २०२०-२१ साठी विद्यार्थ्यांनी ऑप्शन फॉर्म भरताना पहिल्या क्रमांकाची पसंती दिली. त्यामुळे मविप्र पॉलिटेक्निक शासनाच्या केंद्रिभूत प्रवेशप्रक्रियेमध्ये नाशिक जिल्ह्यात प्रथम पसंतीचे ठरले आहे. खासगी पॉलिटेक्निकमध्ये जिल्ह्यात प्रथम पसंतीचे पॉलिटेक्निक म्हणून १०० टक्के प्रवेश पूर्ण झाले आहेत.

या प्रवेशप्रक्रियेसाठी मविप्र संस्थेच्या सरचिटणीस नीलिमा पवार, पदाधिकारी, संचालक, शिक्षणाधिकारी, विविध शाळांचे मुख्याध्यापक यांचे मोलाचे मार्गदर्शन लाभले. राज्य शासनांतर्गत राबविली जाणारी केंद्रिभूत प्रवेशप्रक्रियेसाठी मविप्र राजर्षी शाहू महाराज पॉलिटेक्निकने मान्यताप्राप्त सुविधा केंद्र म्हणून काम पूर्ण केले.

प्रक्रियेवेळी प्राचार्य डॉ. डी. बी. उफाडे यांच्या मार्गदर्शनाखाली प्रथम वर्षासाठी टी. के. ठाणगे, द्वितीय वर्षासाठी एन. ए. गाडे यांनी कामकाज पाहिले. मविप्र पॉलिटेक्निकमध्ये प्रवेशपूर्ण केल्याबद्दल संस्थेच्या सरचिटणीस नीलिमा पवार, अध्यक्ष डॉ. तुषार शेवाळे, माणिकराव बोरस्ते, शिक्षणाधिकारी डॉ. एन. एस. पाटील यांनी महाविद्यालयाचे कौतुक केले.

Dainik Pudhari Dt: 13.1.2021 Page No.07

पॉलिटेक्निकमध्ये शंभर टक्के विद्यार्थ्यांचे प्रवेश

नाशिक, ता. १९ : मराठा विद्याप्रसारक समाज संस्थेच्या राजर्षी शाहू महाराज पॉलिटेक्निकमध्ये शैक्षणिक वर्ष २०२०-२१ साठी विद्यार्थ्यांचा चांगला प्रतिसाद मिळाला आहे. खासगी पॉलिटेक्निकमध्ये भरीव कामगिरी करताना येथील शंभर टक्के प्रवेश पूर्ण झाले आहेत.

पॉलिटेक्निकमध्ये वर्षभर स्कूल कनेक्ट उपक्रमांतर्गत दहावीच्या विद्यार्थ्यांसाठी मार्गदर्शन मेळावे, तांत्रिक उपक्रम, वेबसाइट तयार करणे, रोबोटिक्स, आयसीटीचे मूलभूत प्रशिक्षण, लॉकडाउनमध्येही ऑनलाइन करिअर मार्गदर्शनसह अन्य उपक्रम राबविले. प्रवेश प्रक्रियेसाठी संस्थेच्या सरचिटणीस नीलिमाताई पवार, पदाधिकारी, संचालक, शिक्षणाधिकारी, शाळांचे मुख्याध्यापक यांचे मार्गदर्शन लाभले. महाराष्ट्र शासनांतर्गत राबविली जाणाऱ्या केंद्रिभूत प्रवेश प्रक्रियेसाठी मविप्र राजर्षी शाहू महाराज पॉलिटेक्निकने मान्यताप्राप्त सुविधा केंद्र म्हणून काम पूर्ण केले. केंद्रिभूत प्रवेशप्रक्रियेवेळी केंद्रीय व राज्य आरोग्य मंत्रालयाने जाहीर केलेल्या नियमांचे पालन करून प्रक्रिया सुरळीत पार पाडली. प्राचार्य डॉ. डी. बी. उफाडे यांच्या मार्गदर्शनाखाली प्रथम वर्षासाठी टी. के. ठाणगे, थेट द्वितीय वर्षासाठी एन. ए. गाडे यांनी कामकाज पाहिले.

Sakal Dt.: 20.1.2021 Page No.2

Trending Technology:

A multi-scale simulation approach to grinding ferrous surfaces for process optimization

A fundamental optimization of a grinding process usually involves expensive equipment and experimental matrices covering a large parameter space. To aid this often-cumbersome procedure, here we present three simulation approaches that are intrinsically related and even use the same software, but consider the grinding process at different levels of detail, thus spanning several length scales. Using a molecular dynamics (MD) model, we subject a nanocrystalline carbon steel work piece to grinding by hard alumina abrasives and study material removal and surface topography. A second, much larger MD model allows us to additionally study the microstructural and stress response of a polycrystalline ferritic work piece with a grain size that qualitatively reproduces macroscopic material behavior. Finally, the material point method is introduced as a way of modeling a machining process at the mesoscale in a mesh-free fashion, which is highly advantageous because it intrinsically treats the large deformations during chip formation correctly without the need for repeated remeshing.we show that although our simulations span almost four orders of magnitude in length, the obtained material removal rates agree well. Thus, the presented mesh-free multiscale approach opens new avenues for simulation-aided optimization of grinding processes.

Highlights

- Multiple approaches to modeling a grinding process with meshless simulation methods.
- Length scales range from grains of nano-crystalline steel to 200 microns.
- Each approach offers different pathways to process optimization.
- Material removal rates obtained with the different methods overlap remarkably. Models and simulation methods

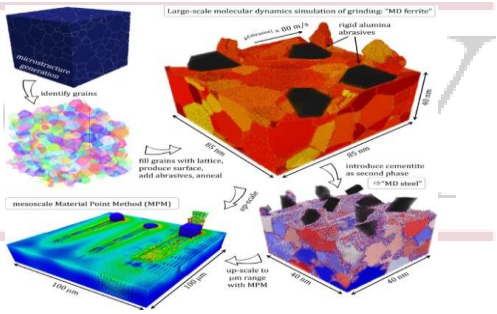


Fig.1. MD work piece generation and system

Results and discussion

To show the present our results obtained for the three different levels of detail. While the MD ferrite system offers the micro structurally more accurate description of the work piece response, it does not contain any hard carbide phases and is therefore a simplified version of a ferrite work piece. This issue is addressed in the second MD system featuring a two-phase mild carbon steel, sacrificing system size for computational manageability, which leads to a fully realistic nano-crystalline work piece.

Conclusions

In this work, we have introduced and showcased three related mesh-less simulation methods to model a grinding process. All approaches explored in this work in principle allow the analysis of material removal, surface quality, grinding forces, stress and temperature distributions in the work piece,

Prof. K. V. Kushare
LME

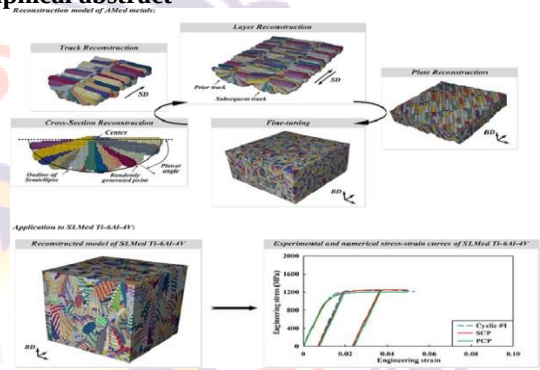
Multi-Scale modelling of structure-property relationship in additively manufactured metallic material

This paper presents a multi-scale modelling framework to evaluate the structure-property relationship of metallic materials fabricated by powder-bed additive manufacturing (AM) technique based on crystal plasticity finite element methods. In this framework, a new synthetic microstructure generation approach is proposed to reconstruct micro-scale models of AMed metals according to the characteristics of grain growth in the fabrication process. The constitutive relation of individual grains in the micro-scale reconstructed models is described with the single-crystal-scale plasticity model. Meanwhile, to reduce the computational cost, a polycrystal-scale plasticity model is also established. The homogeneous elastic moduli tensor is computed according to Mori-Tanaka's theory, while the plastic deformation is described by the equivalent grain set. The proposed multi-scale modelling framework is validated against experiments, where the as-built Ti-6Al-4V samples fabricated by selective laser melting (SLM) are tested under uniaxial tensile, compressive, and cyclic loadings. The presented experimental and computational study demonstrates the capability of the proposed multi-scale modelling framework in the structure-property analysis of AMed metals.

Highlights: A new synthetic microstructure generation approach is proposed for AMed metals according to the characteristics of grain growth in the fabrication process. The constitutive relation of individual grains is provided by the single-crystal-scale plasticity model.

To reduce the computational cost, a polycrystal-scale plasticity model is also established. The homogeneous elastic moduli tensor is computed based on Mori-Tanaka's theory, while the plastic deformation is described by the equivalent grain set.

Graphical abstract



The Fig structure-property relationship of metallic materials fabricated by powder-bed additive manufacturing (AM) technique based on crystal plasticity finite element methods. In this framework, a new synthetic microstructure generation approach is proposed to reconstruct micro-scale models of AMed metals according to the characteristics of grain growth in the fabrication process.

Keywords:
Additive manufacturing
Metallic material
Structure-property relationship
Crystal plasticity
Reconstruction

Mr. Manas Gaikwad
Student, SYME

Robotic process automation (RPA)

Robotic process automation (RPA) is the application of technology that allows employees in a company to configure computer software or a "robot" to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses and communicating with other digital systems.

Any company that uses labor on a large scale for general knowledge process work, where people are performing high-volume, highly transactional process functions, will boost their capabilities and save money and time with robotic process automation software.

Just as industrial robots are remaking the manufacturing industry by creating higher production rates and improved quality, RPA "robots" are revolutionizing the way we think about and administer business processes, IT support processes, workflow processes, remote infrastructure and back-office work. RPA provides dramatic improvements in accuracy and cycle time and increased productivity in transaction processing while it elevates the nature of work by removing people from dull, repetitive tasks.

The technology of RPA can be applied specifically to a wide range of industries.

Process automation

Technologies like presentation-layer automation software – a technology that mimics the steps of a rules-based, non-subjective process without compromising the existing IT architecture – are able to consistently carry out prescribed functions and easily scale up or down to meet demand. Process automation can expedite back-office tasks in finance, procurement, supply chain management, accounting, customer service and human resources, including data entry, purchase order issuing, creation of online access credentials, or business processes that require "swivel-chair" access to multiple existing systems.

IT support and management

Automated processes in the remote management of IT infrastructures can consistently investigate and solve problems for faster process throughput. RPA can improve service desk operations and the monitoring of network devices. Separating scalability from human resources allows a company to handle short-term demand without extra recruiting or training.

Automated assistant

As in voice recognition software or automated online assistants, developments in how machines process language, retrieve information and structure basic content mean that RPA can provide answers to employees or customers in natural language rather than in software code. This technology can help to conserve resources for large call centers and for customer interaction centers.

Prof. R. S. Derle
LCM

Quantum Computing: The fastest computer

Quantum computing is an area of computing focused on developing computer technology based on the principles of quantum theory, which explains the behavior of energy and material on the atomic and subatomic levels. Computers that perform quantum computations are known as quantum computer.

quantum computers use quantum bits or qubits. Just like classical computers, quantum computers use ones and zeros, but qubits have a third state called "superposition" that allows them to represent a one or a zero at the same time. Quantum computers are believed to be able to solve certain computational problems, such as integer factorization, substantially faster than classical computers.

There are various approaches to implementing quantum computers, for example quantum simulation, quantum annealing and adiabatic quantum computation. Technologies such as transoms, ion traps and topological quantum computers use quantum logic gates for their computations. All these approaches use qubits.

A quantum computer can also solve any computational problem that can be solved by a classical computer. Conversely, quantum computers obey the Church–Turing thesis; that is, a classical computer, at least in principle given enough time, can also solve any problem that can be solved by a quantum computer. While this means that quantum computers provide no additional advantages over classical computers in terms of computability, they do enable the design of algorithms problems that have significantly lower time complexities than known classical algorithms. Notably, quantum computers are believed to be able to quickly solve certain problems that no classical computer could solve in any feasible amount of time—a feat known as

"quantum supremacy." The study of the computational complexity of problems with respect to quantum computers is known as quantum complexity theory.

Mast. Aniket Shewale
Student TYCM

Medical Electronics

The demand on high quality and low cost healthcare and medical diagnoses and treatment has been rapidly increased as the aging society is coming. Medical electronics becomes an exciting research frontier of future electronics industry where intelligent instrument or clinical devices which treat intractable neurological disorders or chronic diseases, advanced biomimetic devices and systems, artificial organs, etc. are developed with heterogeneous integration of technologies.

"Medical Electronics" is the study of electronic instruments and devices used for diagnosing and curing the health. It is the design of embedded systems applied to medicine and biology. Sensors play a predominant role in bringing the medical applications to the real world. Sensing elements such as Airflow, Temperature, Humidity, Pressure transducers, Thermistors etc. are proven to be necessary things to carry out medical solutions. Here is a list of electronic applications in the medical field. Implantable medical electronic devices, such as pacemakers, neuro stimulators , manage and treat physiological conditions within the human body, for example cardiac arrhythmia, chronic pain, Parkinson's disease and profound deafness. The patient's demands for improved life quality drive the implantable medical electronic devices to grow fast in a rate of double-digitals over last decade.

Applications of Medical Electronics

- Anesthesia
- Respiratory monitoring
- Blood Pressure analysis
- Oxygen level measurement in the body
- Imaging in Diagnostics
- Visual Impaired scanning (Barcode Scanner)
- For understanding Health, and wellness
- Stress measurement
- Heart rate monitoring
- Monitoring Pulmonary functions
- Glucose monitoring
- Delivering Drugs
- Orthopaedics
- Point of Care Analysis
- Cardiology
- Oncology

Looking to the future is always a difficult task, but it is clear that the electronic health record will play an important role in consoli- ating the information from various medical devices as well as providing readily available data on patients wherever it might be needed. Future medical devices will need to not only address the problems of diagnostic and therapeutic medicine but also be capable of addressing important societal problems.

Mrs. N. D. Athare,
TAEJ

5G Wireless Technology

To support the growth of wireless traffic and the demand for high performance networks, providers have migrated through successive generations of cellular technology, each of which has delivered a substantial increase in capacity and performance. Beginning with s 1G service first introduced in Japan in 1979, a new generation of wireless technology has been introduced roughly once every decade, with the most recent generation, or 4G, introduced around 2010. Today, even as 4G networks continue to be rolled out globally having reached approximately 635 million users by the beginning of 2015 and projected to reach one billion by the end of this year 7 attention has begun to focus on the next generation of wireless, or 5G. But what is 5G? Unlike the previous generations of wireless standards, 5G is likely to consist of a set of different technologies, which will be introduced over time to supplement rather than wholly replace earlier generations of wireless technology to support a variety of emerging use cases. Discussions are already underway in a number of forums about what technical capabilities 5G will need to support, which, in turn, are driven by ideas about how current uses of mobile

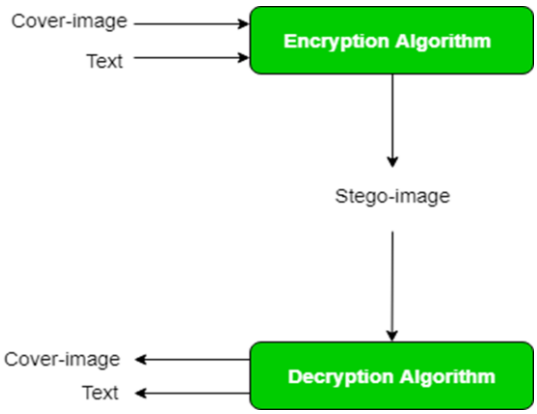
wireless will evolve and what new uses are likely to emerge.

5G is also expected to be used for private networks with applications in industrial IOT, enterprise networking, and critical communications. The first country to adopt 5G on a large scale was South Korea, in April 2019. One expected benefit of the transition to 5G is the convergence of multiple networking functions to achieve cost, power, and complexity reductions. Two organizations the International Telecommunications Union (ITU) and the 3GPP (3rd Generation Partnership Project) are actively involved, among others, with defining the standard for 5G networks. The Frequency band most widely being used for 5G range is 3.3–4.2 GHz. 5G use higher frequencies than 4Gin 24 GHz range. On March 6, 2020 the first-ever all-5G smartphone Samsung Galaxy S20 was released. According to a recent forecast by the GSMA, more than 1.4 billion connections will be on 5G by 2025. The technology promises not only greater speed, but more capacity and lower latency.

Miss. Dhanashree Kirve,
Student TYEJ

Steganography-Data hiding technique

Steganography is the art of hiding information and an effort to conceal the existence of the information. It serves as a better way of securing message than cryptography, which only conceals the content of the message, not the existence of the message. Original message is being hidden within a carrier such that the changes so occurred in the carrier are not observable. In this paper, we will discuss how digital images can be used as a carrier to hide messages. This paper also analyses the performance of some of the steganography tools. Steganography is a useful tool that allows covert transmission of information over an over the communications channel. Combining secret image with the carrier image gives the hidden image. The hidden image is difficult to detect without retrieval. Steganography can be used to conceal almost any type of digital content, including text, image, video or audio content; the data to be hidden can be hidden inside almost any other type of digital content. The content to be concealed through steganography called hidden text is often encrypted before being incorporated into the innocuous-seeming cover text file or data stream. If not encrypted, the hidden text is commonly processed in some way in order to increase the difficulty of detecting the secret content. Steganography, malware developers have also been found to use steganography to obscure the transmission of malicious code. For example, using invisible ink to hide secret messages in otherwise inoffensive messages; hiding documents recorded on microdot which can be as small as 1 millimeter in diameter on inside legitimate-seeming correspondence; and even by using multiplayer gaming environments to share information.
An image is represented as an N*M (in case of greyscale images) or N*M*3 (in case of colour images) matrix in memory, with each entry representing the intensity value of a pixel. In image steganography, a message is embedded into an image by altering the values of some pixels, which are chosen by an encryption algorithm. The recipient of the image must be aware of the same algorithm in order to known which pixels he or she must select to extract the message.



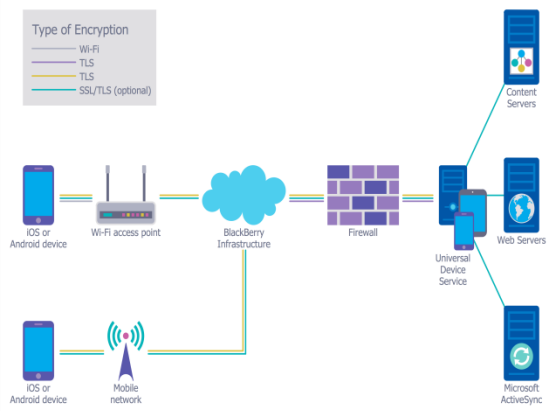
Detection of the message within the cover-image is done by the process of steganalysis . This can be done through comparison with the cover image, histogram plotting, or by noise detection. While efforts are being invested in developing new algorithms with a greater degree of immunity against such attacks, efforts are also being devoted towards improving existing algorithms for steganalysis, to detect exchange of secret information between terrorists or criminal elements.

Prof. S. S. Tile
LIF Dept

Network Security–Security Technique

Network security is a term that describes the security tools, tactics and security policies designed to monitor, prevent and respond to unauthorized network intrusion, while also protecting digital assets, including network

traffic. Network security includes hardware and software technologies (including resources such as savvy security analysts, hunters, incident responders, etc.) and is designed to respond to the full range of potential threats targeting your network. In other words, network security is the defense you use to keep the wrong people away from your sensitive data. The vampires are trying to get in; network security keeps them out. Fairly straightforward, right? Well, within that definition, there are three key focuses that should serve as a foundation of any network security strategy: protection, detection and response. Protection entails any tools or policies designed to prevent network security intrusion. *Detection* refers to the resources that allow you to analyze network traffic and quickly identify problems before they can do harm. And finally, *response* is the ability to react to identified network security threats and resolve them as quickly as possible. Unfortunately, most businesses simply do not know how to follow policy and do this properly. In fact, in a survey of 4,100 executives, departmental heads, IT managers and other key professionals across the U.S. and Europe, it was revealed that nearly three out of four organizations (73 percent)[3] are fielding a novice level cyber security strategy. This is a growing threat, because when network breaches occur and malicious threats come through, there's more at stake than just the data itself. In order to known which pixels he or she must select to extract the message.



Network security devices and tools exist to help your organization protect not only its sensitive information, but also its overall performance, reputation and even its ability to stay in business. Continued operational ability and an intact reputation are two key benefits of effective network security. Companies that fall prey to cyber attacks often find themselves crippled from the inside out, unable to deliver services or effectively address customer needs.

Mast. Devendra Deore
Student, SYIF.

Hybrid Electric Vehicles

Today's hybrid electric vehicles (HEVs) are powered by an internal combustion engine in combination with one or more electric motors that use energy stored in batteries.HEVs combine the benefits of high fuel economy and low tail pipe emissions with the power and range of conventional vehicles. A wide variety of HEV models are currently available. Although HEVs are often more expensive than similar conventional vehicles, some cost may be recovered through fuel savings or state incentives. The tool compares the costs of a selected HEV with a comparably equipped non-hybrid model from the same manufacturer and provides fuel cost savings associated with the HEV option. In an HEV, the extra power provided by the electric motor may allow for a smaller combustion engine. The battery can also power auxiliary loads and reduce engine idling when the vehicle is stopped. Together, these features result in better fuel economy without sacrificing performance. An HEV cannot plug in to off-board sources of electricity to charge the battery. Instead, the vehicle uses regenerative braking and the internal combustion engine to charge. The vehicle captures energy normally lost during braking by using the electric motor as a generator and storing the captured energy in the battery. HEVs can be either mild or full hybrids, and full hybrids can be designed in series or parallel configurations. **Mild hybrids** are also called micro hybrids which use a battery and electric motor to help power the vehicle and can allow the engine to shut off when the vehicle stops (such as at traffic lights or in stop-and-go traffic), further improving fuel economy. Mild hybrid systems cannot power the vehicle using electricity alone. These vehicles generally cost less than full hybrids but provide less fuel economy benefit than full hybrids.

Full hybrids have larger batteries and more powerful electric motors, which can power the vehicle for short distances and at low speeds. These vehicles cost more than mild hybrids but provide better fuel economy benefits. There are different ways to combine the power from the electric motor and the engine. **Parallel hybrids** are the most common HEV design to connect the engine and the electric motor to the wheels through mechanical coupling. Both the electric motor and the internal combustion engine drive the wheels directly. **Series hybrids**, which use only the electric motor to drive the wheels, are more commonly found in plug-in hybrid electric vehicles.

Ms. S. S. Sangamnere,
TAEE

Need For Reactive Power Compensation

The importance of reactive power is increasing with the growing demand for electrical power by many domestic and industrial utilities, in a power system network. The stability and reliability of the electrical power system depend on reactive power management. It is required to generate energy in a more efficient, reliable and cost-effective way. An effective way of delivering electrical energy utilizes technologies like FACTS (Flexible AC transmission system), SVC (Static voltage compensation), etc. to maintain voltage stability, high power factor, and fewer transmission losses. Reactive power plays a crucial role in the power system network.

AC power supply system's produce and consume two types of powers; active and reactive power. Real power or active power is the true power given to any load. It accomplishes useful work like lighting lamps, rotating motors, etc. On the other hand, reactive power is the imaginary power or apparent power, which does not do any useful work but simply moves back and forth in the power system lines. It is a byproduct of AC systems and produced from inductive and capacitive loads. It exists when there is a phase displacement between voltage and current. It is measured in units of volt-ampere reactive (VAR). There are two types of reactive power sources namely dynamic and static reactive power sources. **Dynamic Reactive Power Sources** These include transmission equipment and devices, which are capable to respond to the reactive power changes quickly by injecting or providing a sufficient amount of reactive power into the electrical system. These are of high cost and some of these devices are given below.

• Synchronous generators: Depending on the excitation voltage, active and reactive power generated is varied in synchronous machines. AVR's (Automatic Voltage Regulators) are used to control the reactive power over an operating range in these machines.

• Synchronous condensers: These are types of small generators, used to produce reactive power without producing real power.

• Solid state devices: These include power electronic converters and devices such as FACTS by SVC devices.

• Static Reactive Power Sources

These are low-cost devices and response to reactive power variation is somewhat less than the dynamic power devices. Some of the static resources are given below.

• Capacitive and inductive compensators: These consist of some shunt capacitors and inductors connected to the system to adjust the system voltages. Capacitor generates the apparent power whereas the inductor absorbs the reactive power.

• Underground cables and overhead lines: Current flowing through the cables and overhead lines produces the net magnetic flux which generates the reactive power. A lightly loaded line acts as a reactive power generator while heavily loaded line acts as an absorber of reactive power.

• PV systems: These are used for active power injection as well as harmonic and reactive power compensation in the grid systems by photovoltaic power.

Miss. Sakshi Matale,
Student, SYEE

Dark Web – Fully Elaborated

Since many people knows very little about Dark web and Deep web, in this article I am trying to explain it in general terms. Internet consisting millions of devices and servers can be divided into three categories.

1. The Surface Web
2. The Deep Web
3. The Dark Web, or the Darknet

The Surface Web comprises common web pages which we access through our web browser and search engines. But surprisingly, this portion of web contribute to only about 4% of total internet! 96% remaining part of internet still remain unexplored by most of the people. Internet is much bigger than what is contemplated by many people.

The Deep Web: It is another subcategory which consist of web pages which are not indexed on conventional search engines like Google, Bing or Yahoo. Deep web sometimes accessed through apps along with specific username and password. Deep web is sometimes considered to be last bastion of internet privacy owing to provision of authenticity and restricted access. This is the reason why app-based services are safer than web-based services. In simple terms Gmail app is more secure than Gmail website because Gmail app is a part of Deep web which more efficiently preserves privacy of individual. Deep web is generally used for legit purposes which require anonymity and restricted access. It is used by software companies, government agencies and whistle-blowers.

The Dark Web : The less accessible set of the deep web, used as a black market for illegal activities like drugs dealing, killing humans, child trade, cryptocurrency and data stolen in illegal breaches. Deep Web relies on connections made between trusted peers and requires specialized software like Tor and I2P to access. Dark web activity steadily growing due to its capability to hide user identity through masking IP address and end to end encryption. Encrypted servers

like Tor facilitate easy and protective access to Dark web websites. Any transaction, interaction, service, product, the content available on the darknet cannot be regulated or traced. The websites of the dark web are untraceable due to their URLs. The URLs of darknet's sites are randomly created and they are susceptible to change.

For example, *auutwvprh6odm2qt.onion* link which has a combination of random letters and numbers. Such complicated URLs help to keep the darknet content anonymous and confidential. Sites ending with '.onion' are not usually indexed by dark web search engines. Unregulated nature of the internet is responsible to some extent for the popularity of dark web activities among fraudsters and criminals. Several domestic laws have vigilance over cyberspace activities but they are encountered with numerous limitations due to dynamic changes in methodologies incorporated by criminals with nefarious intent. The speed of change in technology is sometimes difficult to catch by enforcement agencies. Presently, the dark web is essentially an evil because its vexatious use outweighs utilization for good purposes. The sad part of this story is that we are still unable to curb this unethical use because of the inherent limitations of cyberspace. Censorship beyond certain limits would be counterproductive to freedom of accessing information. Education and awareness are the only pills to cure this moral turpitude in the long run because criminals usually target the most vulnerable people. More awareness will substantially bring down vulnerable populace and thus will help in mitigating the number of criminal acts in society.

Mast. Savant Omkar
Student, FYCM

Chemical Engineering Response to COVID-19 Challenges

On March 11, the World Health Organization declared that COVID-19, the respiratory disease caused by the novel coronavirus SARS-CoV-2, is a pandemic. With the lives of millions of people worldwide disrupted by this infectious disease outbreak, chemical engineers are joining the rest of the scientific community to respond to the COVID-19 challenges. Engineers across disciplines are inventing ways to produce critically needed medical supplies. For example, 3D printing is being engaged to cover the ever-increasing need for personal protective gear and other equipment, such as N95 masks, face shields, hands-free door openers, and ventilator components. Accelerating and scaling up the production of ventilators, health care products, food supplies, antiviral APIs synthesis are all central aspects of the responses provided by chemical engineers. A significant challenge for any vaccine will be the scalability of production to generate sufficient doses Another aspect concerning environmental engineers is the persistence of coronavirus in the environment and the efficacy of waste and wastewater treatments. Could composting, mesophilic anaerobic digestion and biofilters be the solution? Modeling and computational methods are being applied to understanding the infectious disease spreading, optimizing the curve, learning from the data to make predictions on the pandemic status and to support decisions on allocating the medical resources for treatment.

AIMS: This Research Topic aims at highlighting the major chemical engineering solutions to the COVID-19 pandemic in terms of manufacturing and logistics of medical supply and persistence of coronavirus in the environment.

We particularly welcome contributions that include, but are not limited to, the following topics: Manufacturing medical supplies (e.g. face masks, shields,ventilatorparts) Logistics on health care products and food supplies Modeling/computation on biosystems related to COVID-19 response Design of medical oxygenators for hospitals (Oxygen Enriched Air) Design of personal oxygenators for individuals Analysis, modeling and design of individual protection masks (aerosols, biological contaminants) Application of 3D printing technologies to mask and individual oxygenators production Waste and wastewater

treatment Exhaust gases treatment.

Mrs. K. B. Holkar
TA, SH

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Happy New Year 2021,
National Youth Day,
Indian Army Day,
Makar Sankranti and
Republic Day to All Readers
On the behalf of
Principal, Faculty, Supporting Staff
and Students.

Dr. D. B. Uphade
Principal