Aspire

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Monthly Newsletter

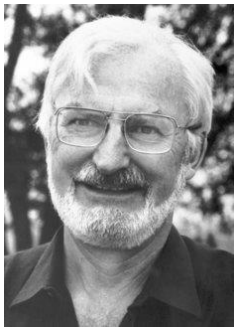
Department of Mechanical Engineering | Volume 11 | Issue 7 | July 2021

Sri Sivasubramaniya Nadar College of Engineering

Rajiv Gandhi Salai, Kalavakkam, Chennai, Tamil Nadu, India

Heinrich Rohrer: The Pioneer of Nanotechnology

Source



Heinrich Rohrer was a Swiss physicist who shared half of the 1986 Nobel Prize in Physics with Gerd Binnig for the design of the scanning tunneling microscope; an invention that gave scientists the ability to image, measure and manipulate atoms for the first time, and opened new avenues for information technology that we are still pursuing today.

Rohrer was born in Buchs, St. Gallen, half an hour after his twin sister. He enjoyed a carefree country childhood until the family moved to Zürich in 1949. Rohrer's finding to physics was rather accidental. His natural bent was towards classical languages and natural sciences, and only when he had to register at ETH Zürich in 1951, did he decide in favor of physics. In the next four years, Professors G. Busch, W. Pauli, and P. Scherrer taught him the rudiments. He then started work on his Ph.D. Thesis in 1955 and it was fortuitous that Jörgen Lykke Olsen trusted him to measure the length changes of superconductors at the magnetic-field-induced superconducting transition.

In summer 1961, Rohrer married Rose-Marie Egger. Their honeymoon trip led them to the United States, where Rohrer spent two post-doc years working on thermal conductivity of type-II superconductors and metals in the group of Professor Bernie Serin at Rutgers University in New Jersey. Then in the summer of 1963, Professor Ambros Speiser, Director of the newly founded IBM Research Laboratory in Rüschlikon, Switzerland, made Rohrer an offer to join the physics effort there. Encouraged by Bruno Lüthi, who later became a Professor at the University of Frankfurt, and, at the time, strongly recommended the hiring of Gerd Binnig, he accepted to start in December 1963.

Rohrer's first couple of years in Rüschlikon were spent studying mainly Kondo systems with magneto-resistance in pulsed magnetic fields. At the end of the sixties, Keith Blazey interested Rohrer to work on $GdAlO_3$, an antiferromagnet on which Blazey had done optic experiments. This started a fruitful cooperation on magnetic phase diagrams, which eventually brought Rohrer into the field of critical phenomena. Encouraged by K. Alex Müller, who had pioneered the critical-phenomena effort in their laboratory, he focused on the bicritical and tetracritical behavior and finally on the random-field problem.

Finally, in 1981, Rohrer and his colleague, Gerd Binnig, introduced a groundbreaking device, the scanning tunneling microscope (STM), at the I.B.M. laboratory, after decades of research in antiferromagnetism, critical-phenomena, nuclear magnetic resonance, and surface physics. The STM enabled scientists to make accurate images of details as tiny as one-25th the diameter of a typical atom. Their idea for the microscope's "lens" was an exceedingly thin wire tip — the width of a single atom. Through a quantum mechanical effect called tunneling, a tiny current of electricity would flow from the tip to a surface to be scanned. The closer the probe got to a surface; the more electricity would flow. A computer would interpret the subtle changes in current to make a contour map of the atomic terrain.

Campus Update

Motorq Campus placement offer for 1.17 Crore CTC to SSN Student

Vrishin Vigneshwar received an offer from Motorq in Campus Placement. His package is 1.17 Crore CTC (27 Lacs and ESOPs worth 90 Lac). He did his internship with Motorq and based on that he has been given a preplacement offer. He will be graduating Computer Science and Engineering in 2022.

B. E/ B.Tech Lateral Entry Admission 2021 in SSN

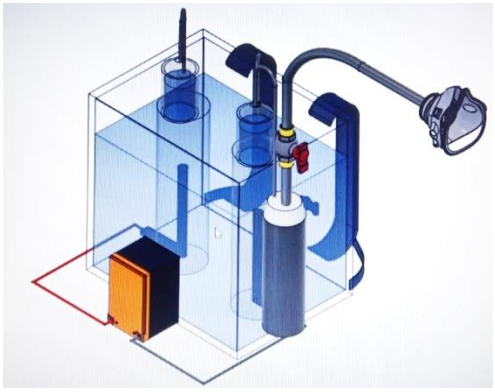
Online Admissions – Lateral Entry 2021 open for B.E/B. Tech Programs

Last date to apply - July 2nd, 2021

Apply Now!
Visit: www.ssn.edu.in

Department Update

Patents Filed



Mr. Raja S, Assistant professor, Dept. of Mechanical Engineering along co-applicants Dr. M S Alphin, Eshwar D filed a design patent titled PORTABLE OXYGEN GENERATOR WITH FACE MASK. 10 June 2021.

Mr. Divya Zindani, AP/Mech has filed a patent titles "ERGONOMIC CAULDRON" bearing application number "344002-001". The filed patent is a collaborative effort between inventors from IIT-Guwahati and MBM Jodhpur, Rajasthan

Brief Details: Cauldron is a large pot (kettle) for cooking or boiling over an open fire. The traditionally used Cauldron has usually two handles on its periphery and is heavily weighted (approx. 1000 kg). In order to overturn it for emptying the cooked food, the operators would use sticks that connects the two handles at the periphery. However, this is not ergonomic for the operators and hence needs to be modified. As such, instead of providing two handles, three handles have been provided on its periphery so that the cauldron can be overturned easily. This ergonomically designed cauldron will ease the weights handled by the operators.

New faculty for the Department

Dr. S. Santosh joined on 1st June 2021 as Assistant Professor. He obtained his PhD from the Department of Metallurgical and Materials Engineering, IIT Madras, Chennai. Subsequently, he obtained a Post-Doctoral Equivalent Fellowship (PDEF) from IIT, Madras which he completed in December 2020. He did his Master's in Manufacturing Engineering from Sri Sivasubramaniya Nadar College of Engineering and was the topper in the Department. He completed his B.Tech from SASTRA. His areas of interests are shape memory alloys Manufacture, processing, characterization and applications.

Book Chapter Published

Lenin N, Sivakumar M, Jayakrishna K and Selvakumar G. (2021), "Supply Chain Adoption During COVID-19 Lockdown: Global Scenario", In: Sakthivel A.R., Kandasamy J., Davim J.P. (eds) Managing Supply Chain Risk and Disruptions: Post COVID-19. Management and Industrial Engineering. Springer, Cham. https://doi.org/10.1007/978-3-030-72575-4_5 ; Pp 57-64.

This chapter presents an assessment of the implications of the COVID-19 pandemic for supply chains and its flexibility to face the demand of products needed by the general public. The disruption caused by the COVID virus occurrence have created abrupt impacts on consumer behavior and their preferences. Due to these impacts, consumers are now increasingly exercising care on what, where, and how they buy.

The panic buying behavior of the consumers also creating the shocks on demand of products. The effects of demand-side shocks on the supply chains are discussed in this chapter with respect to key items like food and medicines and the rapid change in consumption patterns. Potential

supply-side disruptions to supply chains are assessed, including the ingredients to make foods and medicines, workers scarcity, disruptions to transportation, and the issues related with supply of the products between the states and the countries.

Further, this chapter addresses long-lasting effects of COVID-19 pandemic on the nature of supply chains, including the growth of the online products delivery sector, and the extent to the supply chain adoption by the priority of “local” food supply chains during COVID-19 lockdown.

SCI Journal Publication

C. Balasubramaniyan, K. Rajkumar & Santosh S (2021) Wire-EDM machinability investigation on quaternary Ni44Ti50Cu4Zr2 shape memory alloy, Materials and Manufacturing Processes. DOI: 10.1080/10426914.2021.1905833

Shape memory alloy (SMA), also called memory metal, is a smart material that exhibits unique shape memory effect and superelasticity properties. NiTi alloys attract researchers because of their myriad applications in areas such as aerospace, medicine, and robotics. In the present NiTi SMA fabrication, the Cu and Zr elements were added to increase the martensitic transformation temperatures. The current study focuses on the machining of high-temperature Ni44Ti50Cu4Zr2 SMA by coated wire electric discharge machining (W-EDM).

Machining quality features like surface undulation and material removal were studied by considering current (I), servo voltage (SV), pulse on time (Ton), angle of cut (AC), and pulse off time (Toff). Parametric analysis of machining characteristics has been investigated by conducting experiments following the response surface approach based central composite design (RSM-CCD).

It was found that MRR has increased by 57% and Ra by 58% with a gradual increase in pulse on time and applied current and decreases gradually on increasing servo voltage and pulse off time. XRD analysis reveals the presence of an oxide layer on the wire-EDMed surface. The study of SEM

confirms the formation of the melted layer, micro-voids, and micro-cracks, resulting in surface irregularities.

SCI Journal Publication

Influence of Friction Stir Welding Parameters on Dissimilar Joints AA6061-T6 and AA5052-H32

Journal: Arabian Journal for Science and Engineering

Authors: S. Balamurugan, K. Jayakumar, K. Subbaiah



In this present study, two dissimilar aluminum alloys of AA5052-H32 and AA6061-T6 were joined in butt joint configuration to examine the influence of process parameter on tensile strength and microstructural examination. Tool profiles such as square, cylinder, triangle with welding speeds like 30, 60, 80 mm/min and tool rotational speeds such as 800, 950, 1100 rpm were selected as process parameters for friction stir welding. Among the various tool profiles, square pin profile produced good pulsating action of 60 pulses and having max SV/DV ratio of 2.3 which helped to produce higher tensile strength.

Microstructural examination on the nugget zone revealed that higher welding speed causes some cracks in the nugget zone due to insufficient stirring of the materials. Microhardness examination reveals that HAZ of both zones exhibited lower hardness on both sides. Nugget zone at centre was measured with increased hardness than BM of AA5052 and lower than AA6061. SEM fractography revealed that the specimens were failed in ductile mode and specimens failed at higher tensile strength observed with high ductility. Taguchi optimization technique has been implemented and the process parameters combination was optimized for higher tensile strength. The dissimilar joints fabricated at optimized process parameters produced maximum tensile

strength of 181 MPa are as follows: Tool Profile—Square, Tool-Rotational Speed—1100 rpm and Welding speed—60 mm/min

SCI Journal Publication

S. Ram Prakash, G. Selvakumar and K Rajkumar (2021), "Spark plasma processing of semi-conductive titanium carbide dispersed alumina composites", Materials and Manufacturing Processes, Taylor & Francis, UK, DOI: https://doi.org/10.1080/10426914.2021.1944196, IF = 3.046

The spark plasma sintering behavior of the alumina ceramic composite that is modified by the spatial distribution of electrically semi-conductive sub-micron scale titanium carbide particles was investigated. Titanium Carbide was reinforced to the alumina composites in different weight percent concentrations of 20, 25, 30, and 35. The influence of titanium carbide particle distribution on the thermal profile, microhardness, and wear resistance of alumina ceramic composites was studied. Homogenous spatial distribution of sub-micron scale semi-conductive titanium carbide particles in the composite were noticed through scanning electron microscopy, excluding the 35 weight percent sintered sample. In the spark plasma sintering processed samples, X-ray diffraction results revealed strong α-alumina and titanium carbide peaks.

The obtained experimental results show that a higher titanium carbide concentration causes an earlier onset of shrinkage temperature, which positively impacts densification. The addition of titanium carbide particles accelerates the sintering kinetics and improves the properties. Among all composites, the sample with 30 weight percent has the highest relative density of 98.80% and hardness of 20.56 GPa. Besides, the highly densified sample of 30 weight percent has superior wear resistance to all other composites and can be used for high-temperature sliding applications.

SCI Journal Publication

M Sivakumar, N Lenin, K Jayakrishna and G Selvakumar (2021), "A novel approach in selective assembly with an arbitrary distribution to minimize clearance variation using evolutionary algorithms: A comparative study", Journal of Intelligent Manufacturing, Springer, DOI: https://doi.org/10.1007/s10845-020-01720-9; IF = 4.311.

The minimization of surplus components with normal dimensional distributions while making selective assemblies was the only objective considered in the previous research works carried out by various researchers in different periods. Seldom works have been found on selective assembly by considering all dimensional distributions.

In this proposed work, a novel method is developed for making assemblies with zero surplus components and minimum clearance variation by considering arbitrary distribution, to demonstrate the greater improvement in the results than the past literature. Krill Herd algorithm has been implemented for identifying the best combination of groups. Computational results showed that the proposed krill herd algorithm outperformed as compared with existing literature and as well as the results by gaining-sharing knowledge-based algorithm, differential evolution algorithm, and particle swarm optimization algorithm

S R Benin, G Selvakumar, M Sumathi and Renjin J Bright , "Influence of barite particulate filler on the mechanical behaviour of carbon fiber reinforced LY556 epoxy matrix composites", Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science (JMES), Sage, UK, DOI: 10.1177/09544062211017951; IF = 1.386

This work is intended to explore the influence of barite particulate filler on the mechanical behaviour of carbon fiber (Cf) reinforced polymer matrix (CFRP) composites. The carbon fiber utilized for the study was T300 grade and the polymer matrix utilized was LY556 epoxy resin (Epr). The CFRP composites prepared with 55 weight (wt.) % T300 carbon fiber and 45 wt.% LY556 epoxy resin without barite particulate filler was utilized for control experimentation. The CFRP composites with barite filler were prepared by varying the proportion of barite particles from 2.5 wt.% to 15 wt.% in steps of 2.5 wt.%. The composites were prepared using the hand lay-up process and the barite particles were mixed with the epoxy resin by means of ultrasonic agitation. The prepared composites were subjected to tension, compression, hardness, flexural and impact testing. The CFRP composites with 10 wt.% barite particles yielded the best tensile strength, hardness and impact strength. The tensile strength, hardness and impact strength attained an increase of 13.18%, 5.6% and 18.68% respectively, compared to the CFRP composite without barite filler. The compressive strengthof the CFRP composite with 15 wt.% barite filler was observed to be more than twice the compressive strength of the CFRP composite without barite filler. However, the flexure strength reduced steadily with the addition of barite particulates.

Investigation of the effect of water absorption on thermomechanical and viscoelastic properties of flax-hemp-reinforced hybrid composite

Abir Saha, Santosh Kumar, Divya Zindani

First published: 19 June 2021 https://doi.org/10.1002/pc.26164

This study is an effort in this direction that investigates the effect of water absorption on thermo-mechanical properties of flax-hemp-reinforced epoxy composites fabricated using compression hand layup technique with different weight fraction of fiber. The fabricated composites have been characterized physically (density and water absorption), thermo-mechanically (tensile, flexural, thermal conductivity, and dynamical mechanical analysis), and morphologically.

The analysis revealed that hemp-reinforced composites (S1) had the highest water absorption capabilities in comparison to the flax-reinforced composites (S5). Higher water absorption capability had an adverse effect on the mechanical properties of fabricated composites. However, hybrid composites (S2, S3, and S4) reported better performance with regard to S1. The increased water content, however, increased the thermal conductivity of composites and maximum has been revealed for S1 (0.82 W/mK) and minimum for S5 (0.48 W/mK).

External Recognition

Dr. Satheesh Kumar Gopal delivered a talk on "Role of robotics in Manufacturing" on 04.06.2021 as a resource person for the two weeks online Faculty Development Programme (FDP) on "Advances in Composite Materials, Manufacturing Processes and Optimization Techniques" which is scheduled from 01st – 14th June, 2021, Organized by Department of Mechanical Engineering, AMET University, Chennai.

Dr. Satheesh Kumar Gopal delivered a talk on "Role of robotics in the Future" on 07.06.2021 as a resource person for the workshop on Robotics titled "DROIDLIFE", Organized by the Department of Mechanical Engineering, SRM Institute of Science and Technology, Chennai.

Dr. Satheesh Kumar Gopal delivered a talk on "Implications of robotics: Healthcare & Assistive technologies" on 18.06.2021 as a resource person for the 5-day Faculty Development Program on "System design for Healthcare and Assistive Technologies" organized by the Department of Electronics and Communication Engineering, Sri Sivasubramaniya Nadar College of Engineering, Chennai between June 14 – 18, 2021

Dr. G Selvakumar, Associate Professor / Mech, attended Curriculum Advisory Committee meeting (online) as an external academic peer member at the Department of Mechanical Engineering, Francis Xavier Engineering College, Tirunelveli - 627003 on 09.06. 2021..

Mr. Divya Zindani, AP/ME delivered a guest lecture on "Decision support systems for green and sustainable technologies" at department of ME, Parul Institite of Engineering and Technology, Vadodra, Gujarat on 02-06-2021.

Faculty Writeup

Mr. NAGARAJAN S, Lab Instructor writes

Completed Alison – Courses

1. Diploma in Basic English Grammar
1. Working with Students with Special Educational Needs
2. Manufacturing Strategy - Quality Management and Operational Excellence

Webinars & Quiz Attended

1. Attended the Webinar "**Debunking COVID Myths**" organised by Department of Mechanical Engineering in Association with IIC, SRM Institute of Science and Technology, Ramapuram Campus Chennai, on 29/05/2021.
3. Attended the Virtual Workshop on **"Arduino"** Organized by Indian Society for Technical Education (ISTE) Student Chapter in association with e-flip Magazine conducted on 30th May, 2021.
4. Attended Webinar on "Smart City", "Sustainable in Engineering", "Role of Electric Vehicles "Conducted by Department of Energy and Environment Engineering, Saveetha School of Engineering, Tamilnadu on 05/06/2021
5. Attended Webinar on "Digitization of Learning: Issues and Concerns of Safety and Securities of Children" by National Institute of Disaster Management, Delhi on 25/06/2021.
6. Attended one day online Workshop on "Advanced Non-Destructive Testing Techniques and its Applications" Conducted by Department of Mechanical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam on 28/06/2021.
7. Attended Online Quiz Completion "Worlds Environment Day 2021" Conducted by Department of Energy and Environment Engineering, Saveetha School of Engineering, Tamilnadu on 05/06/2021.

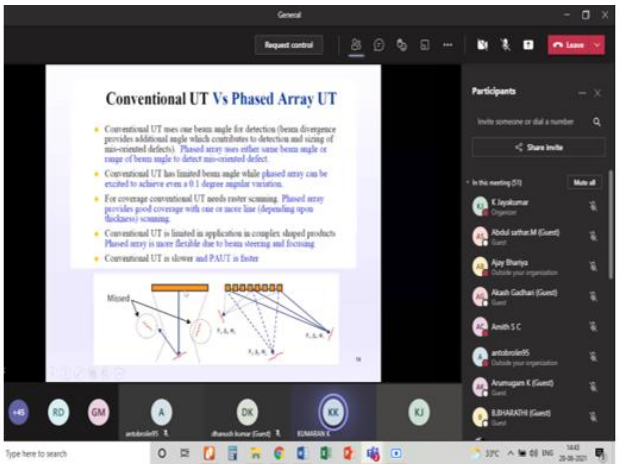
Writeup on one day national workshop (virtual mode) on Advanced Non-Destructive Testing Techniques and its Applications

Dr. R. Damodaram, Dr. A. K. Lakshminarayananand and Dr. K. Jayakumar, Associate Professors conducted a one-day national workshop (virtual mode) on **"Advanced Non-Destructive Testing Techniques and its Applications** "on **28/06/21 (Monday).** Around 140 participants were

registered, and 54 participants were attended the workshop. The major participants are from DRDO, ARCI, Hyderabad, IIT Madras, IIT Dhanbad, IIT Kharagpur, Manipal Academy of Higher Education, Dubai, NIT Trichy, VIT Vellore, Kirloskar Pneumatic Company, Sandip Institute of Technology and Research Centre, Nashik, Toshiba JSW Power Systems Pvt. Ltd., Velammal Engg College, Chennai, Channabasaveshwara Institute of Technology, Karnataka, SSN College of Engineering, Easwari Engineering College, Rajalakshmi Engineering College, Rajadhani Institute of Engineering and Technology, Thiruvananthapuram, etc.



First two sessions were delivered by **Mr. ANTO BROLIN. V,** SENIOR INSTRUCTOR-NDT, ANSA Training & Quality Assurance Pvt. Ltd. Chennai. He gave a talk on basics, application and demonstration on NDT techniques including LPT, MPT, RT and UT.



Snapshots of Workshop

Third session was delivered by **Mr. K. KUMARAN,** MANAGING DIRECTOR / ASNT NDT LEVEL 3/ ISO, 9712 NDT LEVEL 3, ANSA Training & Quality Assurance Pvt. Ltd. Chennai. He talked about the application of Phased Array UT & TOFD techniques. The workshop was interactive, and participants expressed interest in doing internship and MoU with ANSA Training & Quality Assurance Pvt. Ltd.

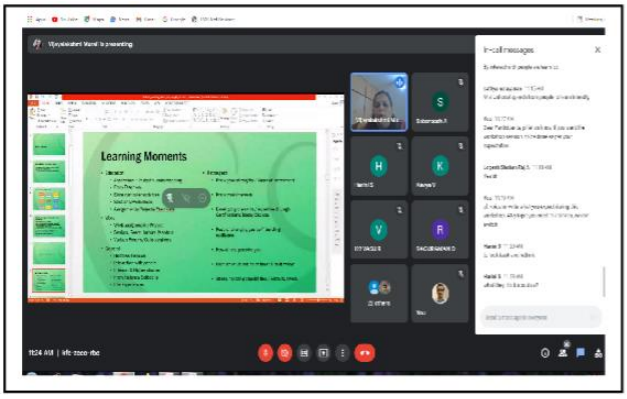
One Day Online National Workshop on "Honing Right Skills for a Bright Career"

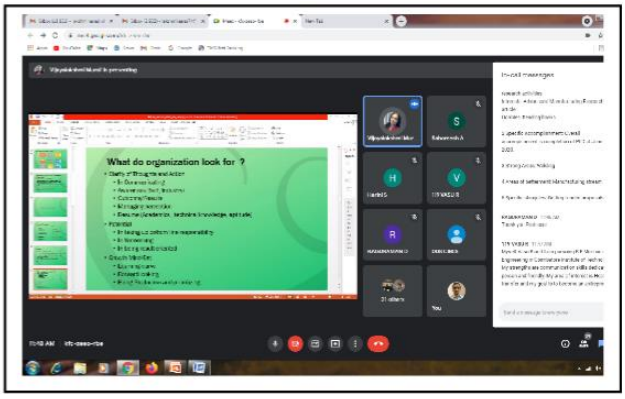
In association with M/s Mbold, Chennai, TN, India.

Coordinator: Dr. N. Lakshmi Narasimhan, Associate Prof/Mech, SSNCE

A One day National Workshop on "Honing Right Skills for a Bright Career" was organized by the Department of Mechanical Engineering jointly with M/s Mbold, Chennai on June 26, 2021. The event was part of our AICTE-IIPC activities. About 40 participants across the country had participated in this Online workshop and made the event lively. As a coordinator, I am extremely thankful to Ms. Vijayalakshmi Murali, Founder & Director, Mbold, Chennai for the support towards Organizing the programme. The workshop commenced with a formal welcome note by the coordinator (Dr. NLN) followed by his introduction to Careers and Skills highlighting their Intricacies.

Followed was the invited talk of Ms. Vijayalakshmi covering several aspects pertaining to building Career and Skills. The speaker made the session enlightening through many practical exercises and interactions with the participants. The current industrial expectations, the approach to be followed for honing one's skills, career focus, tips for career building, Learning moments, were all part of the day's knowledge sharing by the invited speaker. Overall, the workshop was well received and the feedback was very encouraging. I thank our Management, Principal and HoD/Mech for the support and encouragement towards the conduct of the programme. Due thanks to M/s Mbold is conveyed here for the support towards the conduct of the workshop. My special thanks to all the participants and their institutions as well. Shown below are the glimpses of the Workshop.



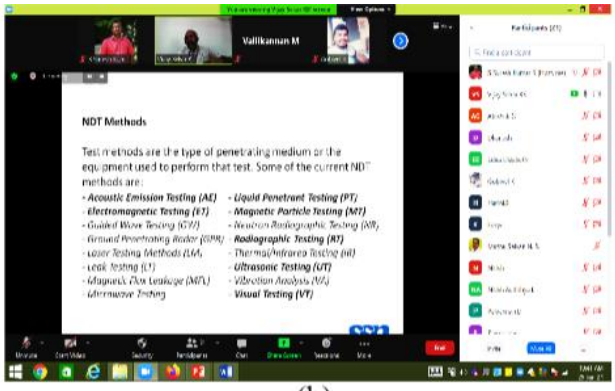


Workshop on New Product Innovation using failure analysis

Dr. S. Suresh Kumar and Dr. K. S. Vijay Sekar have conducted a one-day online workshop titled "New Product Innovation using failure analysis" on 29th June 2021 (Tuesday). The workshop was aimed to explore the various failures in the field of aerospace, marine and automobile

components for investigation. Non-destructive failure detection methods such as, eddy current testing, dye penetrant testing and magnetic particle method were also discussed with practical case studies. Around 25 participant including students and faculty members attended the workshop and the concept of video/ animation based interaction was well appreciated by the participants. Following are the snapshots of the online workshop.

(a)



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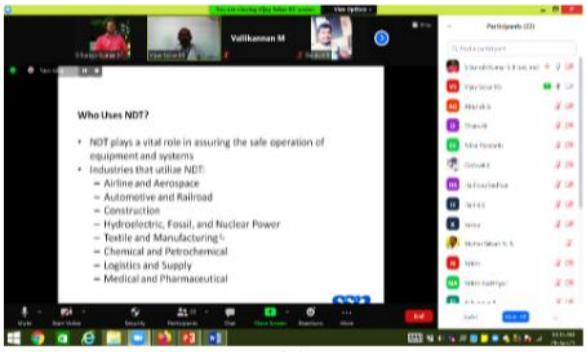
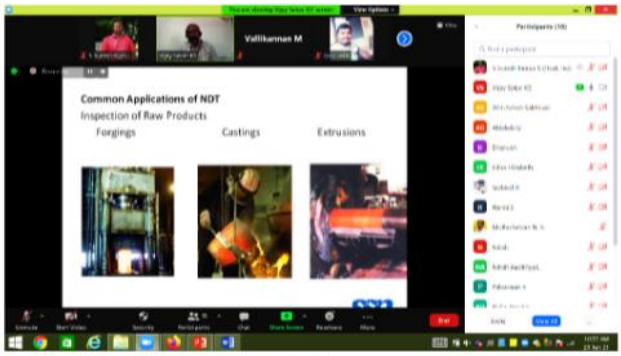


(c)



(d)

Publications in Scopus and Other monthly Activities

Dr. Ananthapadmanaban D, Facing challenges and uncertainties in work during COVID-2, GIS Science Journal Volume 8,Issue 6, 2021

Dr. Poovazhagan Lakshmanan, G. Kumanan , L. Arunkumar , S.C. Amith, Experimental investigations of material removal rate on Mg/SiCp-flyash hybrid metal matrix composites by electrical discharge machining, Materials Today Proceedings: Elsevier, 46, 986–990, 2021.

Arun Arumugam , Poovazhagan Lakshmanan, Sarangapani Palani, K. Parthiban, Wear behavior of Ni-P and Al2O3 electroless nano coating on aluminium alloy, Material Today Proceedings: Elsevier, 46 , 1066–1070, 2021.

K. Parthiban , Poovazhagan Lakshmanan, Sarangapani Palani , Arun Arumugam , Electroless deposition of SiC Nano Coating on Aluminium alloy and evaluation of wear resistance and electroless characteristics, Materials Today Proceedings: Elsevier, 46 , 1096–1100, 2021.

S.C. Amith , Poovazhagan Lakshmanan, M. Anand Kumar, Gowtham Kumarasamy, Microstructure and mechanical behavior of magnesium rare earth alloy nanocomposite fabricated by hybrid casting method , Materials Today: Proceedings Elsevier, 46 ,1008–1012, 2021.

Vinayaka N, Avinash L, Manjunath Patel GC, Chithirai Pon Selvan, Vikram Kumar S Jain, S. A. Srinivasan & Harsha hm, Mechanical, Microstructure and Wear properties of Al 6113 Fly Ash reinforced Composites: Comparison of as-cast and Heat-treated Conditions, Advances in Materials and Processing Technologies, https://doi.org/10.1080/2374068X.2021.1927649, 2021

Bania, DivyaZindani, Saikat Ranjan Maity, Optimization of ultrasonic machining (USM) parameters on micro hole drilling of graphene oxide/pineapple leaf filler reinforced epoxy hybrid composite using evaluation based on distance from average solution (EDAS) method,Angkan, Materials Today: ProceedingsArticle in press 2021

Dr. K.S. Vijay Sekar, Associate Professor, successfully attended and passed the two day "Journal Citation Reports (JCR) Training & Certification Program 2021" organized by Clarivate Analytics (WOS), (scored 93.3 % in the training quiz conducted online) on 15.06.2021 and 17.06.2021

Dr. Lakshminarayanan A K,Attended a DC Meeting for a research scholar doing Ph.D in the department of mechanical engineering, SRM Institute of Science and Technology Kattankulathur - 603203 on 11.06.2021

Dr. Lakshminarayanan A K, Attended a Pre-synopsis Seminar as Doctoral Commitee Member for a Research Scholar working in Homi Bhabha National Institute and Indira Gandhi Centre for Atomic Research (IGCAR) on 17.06.2021

Dr. Satheesh Kumar Gopal along with Dr. P. Vijayalakshmi, Prof. / ECE, Dr. M. Anbuselvi, Asso. Prof. / ECE and Ms. M. Dhanalakshmi, Asst. Prof. / BME have jointly organized a 5-day Faculty Development Program on “System design for Healthcare and Assistive Technologies” between June 14 – 18, 2021.

Dr.Poovazhagan L, Dr Rajkumar K and Dr Anand Ronald B have successfully organized the one day online workshop on the topic of "Composite Materials – Fabrication Methods" on 18.6.21.

Dr. N. Lakshmi Narasimhan, Associate Prof/Mech, Organized a One Day Virtual National Workshop on "Honing RIght Skills for a Bright Career", jointly with MBold, Chennai, on 26.6.2021.

Dr K.S.Vijay Sekar and Dr.S.Suresh Kumar, Asso. Professor's conducted a National level technical workshop on " New product innovation using failure analysis (Interactive video workshop)" under the SSN - IIC banner on 29.06.2021

Dr. R. Damodaram, Dr. A. K. Lakshminarayananand and Dr. K. Jayakumar, Associate Professors conducted a one-day national workshop (virtual mode) on "Advanced Non-Destructive Testing Techniques and its Applications "on 28/06/21 (Monday).

Dr. G Selvakumar, Associate Professor / Mech, evaluated (Online) M.Tech (Energy & Environmental Management) dissertation of JAIN (Deemed- to - be University), Bangalore and conducted Viva-voce examination on 11.6.2021

Non-Teaching Staff Activities

Mr. Subramani R /Lab Assistant/mech, "ALISON COURSE COMPLETED Mechanical Engineering - Plate Heat Exchanger Fundamentals"

Mr. P. Balasundaram / Lab Assistant /Completed Alision Course / Devops Application Life Cycle Management ON 24.06.2021

Mr. P. Balasundaram / LAB ASSISTANT / Participation In One Day National Workshop On Advanced Non-Destructive Testing Techniques And Its Applications – 28th June 2021.

Mr.Balasundaram P / Lab Assistant Gr-1 (Sr) / Participated In One Day Workshop Advanced Non Destructive Testing Techniques And Its Application - Dated on 28.06.2021

Student Write-up

Student Activities

S.No	Date	Activity done during the month
		SECOND YEAR
1)	9/06/2021	VIVEK SRIDHAR, 2nd year, • FBAC workshop • Internship in a garage
		THIRD YEAR
1)	27/06/2021	GUNDEPUDI V SURYA SASHANK, 3rd year,  • Project - Completed a project called AutoMOM which noted down minutes of the meeting using Natural Language text processing. • Paper Presentation- Presented a paper on the foundation of future technology, especially quantum technology in computation, healthcare, and communications. The paper also covered ideas such as Deep learning for communication and Intelligent reflecting surfaces. • Volunteering - Helped mentor kids every week on basic English communication along with personal Hygiene. Also worked with the Down Syndrome federation of India by spending time with the gifted children. • Publication - Co-Authored a paper on fingerprinting and indoorlocalization (https://ieeexplore.ieee.org/document/9419388)
2)	03/06/2021	VARUNA G R, 3rd year, • Internship at Dow Chemical International Pvt Ltd
3)	03/06/2021 20/06/2021	G VISWAPRIYA, 3rd year, • Internship at Dow Chemical International Pvt Ltd • Volunteer-Talent Quest for India Express, Phone mentoring
4)	03/06/2021	SHOBA E, 3rd year, • Internship at Dow Chemical International Pvt Ltd

5)	03/06/2021	**NANDITA S**, 3rd year, • Internship at Dow Chemical International Pvt Ltd
6)	03/06/2021	**AKSHAYA R**, 3rd year, • Internship at Dow Chemical International Pvt Ltd
FINAL YEAR		
1)	11/06/2021	**RAGHAV ARVIND T**, 4th year, • Journal/Publication-Mechanical Characterization and Comparison of Glass Fibre and Glass Fibre Reinforced with Aluminium Alloy (GFRAA) for Automotive Application" was published in Materials Today: Proceedings 46P2 (2021) pp. 1181-1186.
2)	14-06-2021	**V VISHNU SRINIVASA PRASAD**, 4th year, • Selected as a knowledge intern for the ONLINE SUMMER INTERNSHIP @ Smart Factory, IISc. One among the 236 knowledge interns and 28 research interns selected from an overall of 3006 applications.

V Vishnu Srinivasa Prasad, IV-year, writes...

Hello everyone, I am V Vishnu Srinivasa Prasad of final year, Mechanical Engineering. I am extremely elated to share that I have been selected as a knowledge intern for the ONLINE SUMMER INTERNSHIP @ Smart Factory, IISc. This opportunity came to my notice when I was scrolling through my LinkedIn feed in the first week of this month. It was posted by Dr. Amaresh Chakrabarti, who is the head for the Centre for Product Design and Manufacturing at IISc. I was, by this time, on the lookout for any sort of learning/internship opportunity on various platforms since I wanted to make better use of my time. Since it was manufacturing and design oriented, applicable for pre-final and final year students, and completely online as well, I was naturally inclined towards applying for it and did the same without any consideration of getting selected or not. The application window was a very tight 4 days. The application was a relatively easy process, with me having to fill out a google form with some personal details, and a short writeup of what I knew about Industry 4.0 and smart manufacturing. Then I received a mail on the 13th of this month from IISc stating that there were two types of internship- Research and Knowledge, and that I had been selected for the knowledge internship. The selection criteria wasn't mentioned, but out of a total of 3006

applicants, 28 students were chosen for the research type internship and 208 students were chosen for the knowledge type internship. This list was further filtered to 28 research interns and 146 knowledge interns after verification of validity of the documents submitted by us.

Given the situation, all events were announced to be online, in the form of webinars delivered by various national and international speakers, and video tours of the Smart Factory and various manufacturing processes at the IISc campus. The schedule for a total of 15 events for the knowledge interns and 17 for the research interns starting from 14th June to 15th August was provided in the orientation session on 14th June.

7 events have taken place till date and the experience; though feeling unnatural, tiring, taxing on several levels; was a real treat. Hearing experts talk on various topics and technologies that are about to transform the whole domain of manufacturing and design, watching a small, albeit smart factory functioning from the comfort of my home and most importantly, being selected among 3000 odd applicants and given this opportunity has been a definite morale booster during these uncertain times.

Viswapriya G, III-year, writes...

I'm Viswapriya, 3rd year Mechanical. I recently got an opportunity to mentor a 9th student from a village near coimbatore through TQI. Talent Quest for India (TQI) is a volunteering organization with a vision to create socially responsible leaders in every livelihood. They have a lot of programs, one of which is phone mentoring. The idea of phone mentoring is, COVID has been an academic pause for the majority of the school students especially in rural areas and students in orphanages who wouldn't have the privilege of attending online classes. Hence, the action plan is to facilitate phone mentoring to students of class 6-8 to engage them constantly in an effective learning process. Every mentor is assigned a mentee and they will interact for half an hour daily for 30 days with modules focussing on English, GK, Sports, Science Facts and moral story discussions.

It was personally a rewarding experience for me. It helped me broaden my perspective and made me realise the importance of helping out each other. We wouldn't be where we are without someone's nurturance. I would like to take this opportunity to vitalise people to find some time and make it worthwhile.

Ambarish S, III-year, writes...

coursera

I am Ambarish S from 3rd year Mechanical Engineering. I have done three online courses in the month of January , February, and June 2021 through a web platform called Coursera. Coursera is an online platform for learning courses of our choice. I am very pleased that I can do the courses freely since it is sponsored by our college for its students. Through Coursera, I have completed two computer language course and an english proficiency course. Since I am a mechanical student, higher level computer courses are not included in my curriculum. With the help of these courses, I am confident that I can crack my placement exams. I thank SSN College of Engineering for sponsoring it.

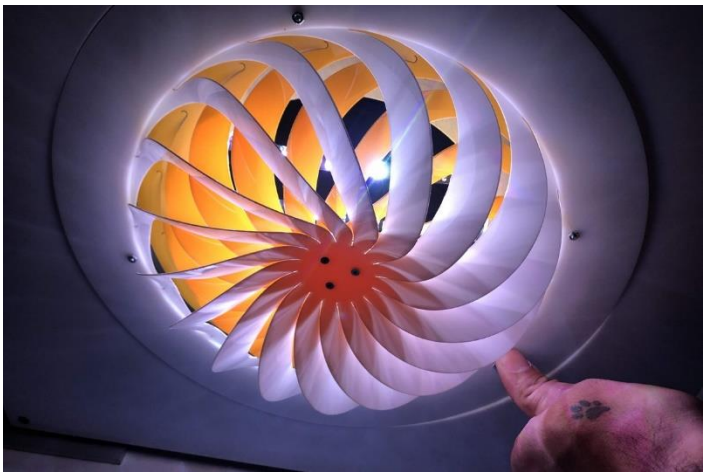
Mech Marvel

How it bends without bending

Normally, you don't want materials to bend under pressure when you're creating anything. That buckling motion, however, allows flat-packed materials to be twisted into usable three-dimensional structures in a novel Harvard University-designed system.

The majority of extant "buckling-induced deployable constructions" are made out of connected straight parts that are popped into shape using straight linear motion, which frequently necessitates a significant amount of force from the operator. Folding chairs are a common source of frustration.

In search of a simpler solution, Harvard researchers began creating objects made entirely of interconnected curved parts. Curved items (like beams) are often less mechanically stable than their straight equivalents. This is, in most cases, an unfavourable trait. However, in the case of pop-up devices, this implies that they're easier to cinch into the proper shape.



Not only would such "Kiriform" things be easier to move and store than their non-buckling equivalents, but they should also be cheaper to produce, according to reports. They're also more flexible to diverse purposes since their shape may be altered progressively.

Prof. Katia Bertoldi, the study's principal author, adds, "This new platform can be extended to realise functional structures and devices from the millimetre to metre scale using a variety of different materials." "These structures could be used as medical devices, optical devices like camera focusing mechanisms, deployable wheels and turbines, furniture, or deployable shelters," according to the researchers.

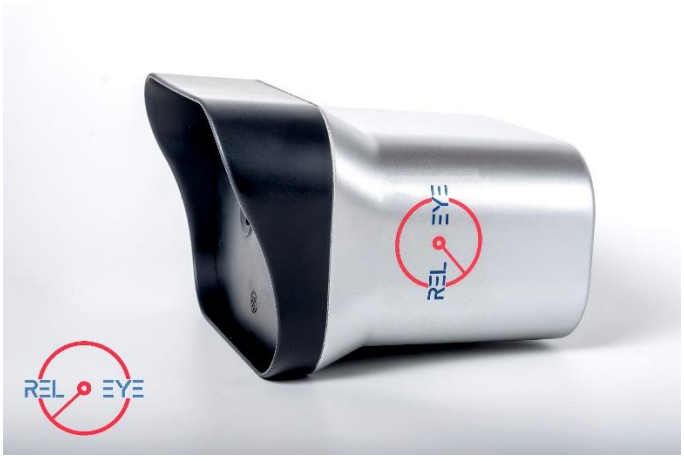
The research was published in the journal Advanced Functional Materials recently. This video shows the Kiriform objects in action.

Corporate Story

Optimized Electrotech

Optimized Electrotech Private Limited (OEPL) is an Indian Electro-Optics company making Indigenously Designed, Developed and Manufactured (IDDM) Surveillance systems. The company was established in 2017 with a vision of creating a footprint in Indian Defence industry by providing cutting-edge solutions customized to India's requirements. We build high-end Electro-Optic surveillance systems for Strategic and Commercial buyers. These products are researched and proven at India's most discerning clients for land and aerospace applications. Their vision is to become a global leader in providing Security solutions to National & International Defence and Aerospace organizations. The company envisages to become a player of reckoning in Homeland security, Defense Intelligence, Surveillance and Reconnaissance & Machine Vision.

Their products use scientific CMOS, Cooled and uncooled Microbolometers as well as MCT detectors along with our indigenously designed Reflective and Refractive Optical systems to offer solutions across a wide segment of EM spectrum and for a variety of FOV. Mil-grade, Industrial grade and Commercial grade versions of raw material are used for different applications / customer segment thereby ensuring perfect price to performance ratio.

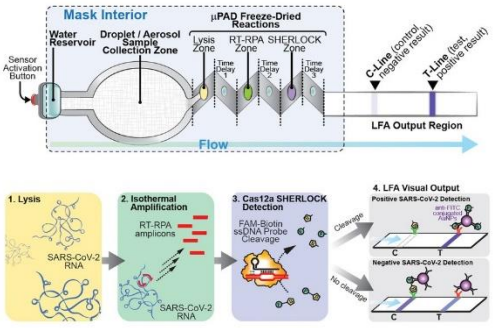


Omnivision is the most sophisticated product for Long Range Surveillance in all weather or light conditions. The system provides high contrast images for post processing and analyzing 24x7 365 days of the year. Its thermal capabilities allow it to capture images even in zero light conditions, enabling a 24-hour operation. The combined capabilities make this system the most comprehensive solution for all Long-Range Imaging applications. Based on the varying light or weather conditions, the system automatically adjusts image processing to get the most optimum output. Omnivision has applications in Border Security, Perimeter Surveillance, Critical Asset Protection, Port Security, Vehicle Mounted Surveillance among many more.

Take a look at their openings, and drop your CV at their careers page.

Amazing Innovation 195

MASK THAT DETECTS COVID-19!!!

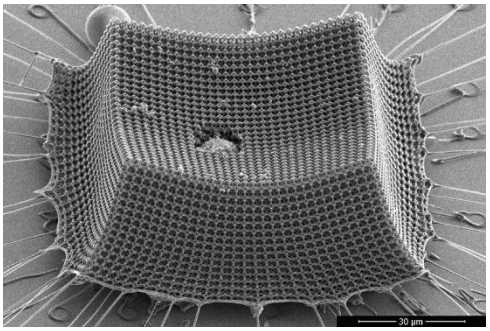


Researchers from MIT and Harvard have demonstrated a cutting-edge biosensor technology by developing a face mask that can detect SARS-CoV-2 in a wearer's breath within just 90 minutes. The sensor technology can be programmed to detect any kind of virus or toxin and is small enough to be integrated into clothing fabrics. The biosensor has been in development for several years and is based on a new technology dubbed wFDCF (wearable freeze-dried cell-free). Unlike previously developed biosensors that require the incorporation of living cells, this system extracts and freeze dries the cellular machinery needed to detect organic molecules. The face mask presents the most advanced application of the wFDCF technology to date. Several biosensors in the mask are activated when a button is pressed, releasing a small reservoir of water. This liquid hydrates the freeze-dried molecules in the sensor which can analyze droplets from a wearer's breath.

Source:https://newatlas.com/science/face-mask-detects-coronavirus-mit-harvard-biosensor/

Amazing Innovation 196

ULTRALIGHT ARMOR OUTPERFORMS KEVLAR

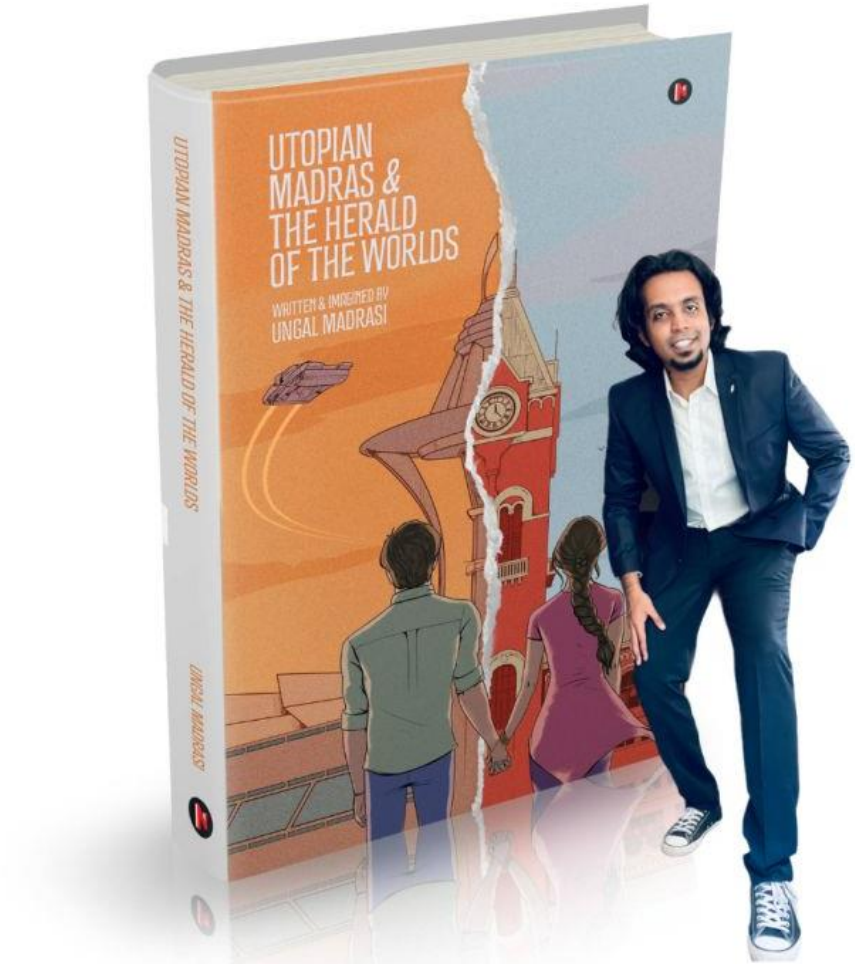


Scientists at MIT have used advanced nanoscale engineering to craft a new armor material they say outperforms Kevlar and steel. The starting point for the promising new material was a photosensitive resin, which was treated with lasers to form a lattice pattern made up of repeating microscopic struts. This material was then put in a high-temperature vacuum chamber, which converted the polymer into an ultralight carbon with an architecture originally inspired by special foams designed to absorb impacts. The impact experiments involved a glass slide coated with a gold film and silicon oxide particles on one side. An ultrafast laser is then beamed at the slide and generates a plasma, or rapidly expanding gas, which sends the particles flying off the surface towards the target. Adjusting the power of the laser in turn adjusts the speed of the projectiles, allowing the scientists to experiment with a range of velocities in studying the potential of their new armor material.

Source: https://newatlas.com/materials/ultralight-armor-material-struts-carbon-kevlar/

Alumni Writeup

Novel by Jose Rohan from the Mech 2018 batch



I'm very happy to inform you that I've published my debut novel "Utopian Madras & the herald of the Worlds". I'm currently working at Fresh works. I began writing this novel last year when the World first went into lockdown and it took me almost a year to complete and publish it.

It's a science fiction story set in Chennai. I've also borrowed elements from the Mythical land of "Kumarikandam" along with placing references in it to the early Tamil Sangams.

Jose Rohan, Mech 2018

Alumni association activity for June

Name of the event: Group Discussion with alumni
Date(s) of the event: 05-06-2021
Number of persons attending: 9
Faculty Coordinator: Dr.C.Arun Prakash
Student Coordinators: Mohanraj.A, Sabareesh.A.

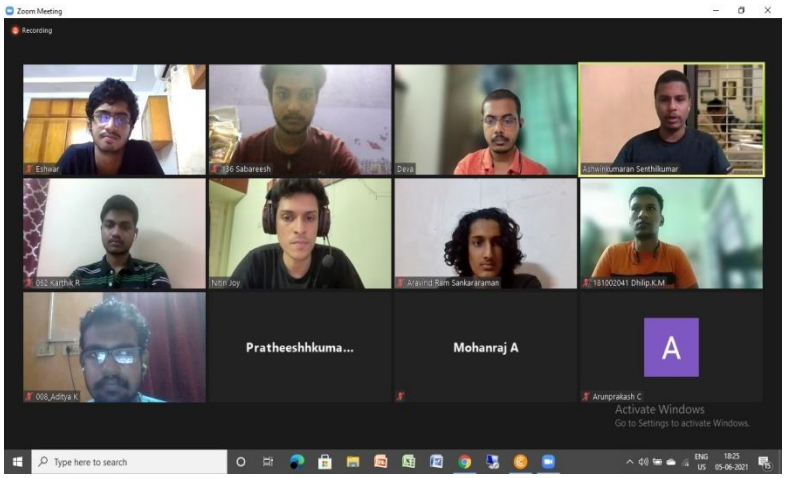
On June 5th, the ALUMNI ASSOCIATION of the mechanical department conducted “GD with alumni”. There were 9 attendees from the 3rd year mechanical A section. Mr. Pratheeshh Kumar, Mr. Nitin Joy and Mr. Devaprashanth were the chief guest/ alumni speakers for the event.

It was a very interactive event and there were a lot of takeaways from it. Initially, the students asked a lot of questions regarding placement and the interview process. The alumni were very interactive and answered all the questions in detail.

Afterwards, the event moved to the next stage where the participants attended a mock GD. The topic was **“India to launch e-vehicles. Choose a company**.” The students selected different companies and the GD contained two rounds. In the first round, each of them introduced the company that they chose and gave a point on why the company chosen by them is fit to launch e-vehicles in India.

In the second round, everyone put forth some valid points and there were debates among a few. After fifteen minutes, the discussion came to an end.

The alumni gave detailed feedback to each and every student on how they can improve, post which the event came to an end



Research news and Forthcoming event

National Aeronautics and Space Administration
NASA Johnson Space Center
2020 Human Exploration Research Opportunities (HERO)
Last date for submission of the project proposal: 30-Jul-2021
https://www.grants.gov/web/grants/search-grants.html

Department of Health and Human Services National Institutes of Health

BRAIN Initiative: Pilot resources for brain cell type-specific access and manipulation across vertebrate species (U01 Clinical Trial Not Allowed)
93.173 — Research Related to Deafness and Communication Disorders
93.213 — Research and Training in Complementary and Integrative Health
93.242 — Mental Health Research Grants
93.273 — Alcohol Research Programs
93.279 – Drug Abuse and Addiction Research Programs
93.286 — Discovery and Applied Research for Technological Innovations to Improve Human Health
93.853 — Extramural Research Programs in the Neurosciences and Neurological Disorders
93.865 — Child Health and Human Development Extramural Research
93.866 — Aging Research
93.867 — Vision Research

Last date for submission of the project proposal: 19-Oct-2021
https://www.grants.gov/web/grants/search-grants.html

Department of Health and Human Services National Institutes of Health

NIAID Research Education Program (R25 Clinical Trial Not Allowed)
Allergy and Infectious Diseases Research

Last date for submission of the project proposal: 07-Dec-22
https://www.grants.gov/web/grants/search-grants.html

Scopus-Indexed Springer International Conference on Machine Learning and Autonomous Systems [ICMLAS 2021]

http://icmlas.com/

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)
CHENNAI

The Second International Conference on

Robotics, Intelligent Automation and Control Technologies

23rd-25th September 2021

About the Conference

School of Mechanical Engineering, VIT Chennai (India) in association with School of Computing, Engineering and Digital Technologies, Teesside University (UK) are organizing a three-day Virtual International Conference on Robotics, Intelligent Automation and Control Technologies (RIACT 2021) to take place on 23rd, 24th and 25th of September 2021. The main objective of RIACT 2021 is to provide a virtual platform to researchers and practitioners from both academic institutions and industries to meet and share cutting-edge developments in the areas of Robotics, Intelligent Automation, Mechatronics, Adaptive Control, Industry 4.0, Smart Energy and associated disciplines. This virtual conference also provides an opportunity to exchange research ideas and a platform to develop partnerships and collaborations.

Key Topics & Publication

• Robot Design, Development & Control • Mobile & Autonomous Robots • Rehabilitation Robots & Devices • Agricultural, Space & Underwater Robots • Medical & Service Robots • Collaborative Robots • Intelligent Automation Systems • Intelligent Fault Detection and Diagnosis • Robust/Adaptive Control of Robotic System • Motion Planning and Control • AI in Robotics, Industrial IoT • Cognitive Automation • Image Processing & Vision Systems • Actuators & Sensors • Mechatronic Systems • HMI, SLAM, ROS • CAD/CAM/CAE • Vehicle Control Applications • Deep learning in Robotics • Smart Energy System and Smart Buildings • Smart Manufacturing and Industry 4.0.

** MDPI *Robotics* journal with discounted OA fees **

** *Journal of Robotics and Control* or Scopus Indexed Proceedings - No Publication Fee **

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Dr Attila Vidacs, Hungary
Ing Erik Pekkeriet, Netherlands
Prof Vikram Kapila, USA

Dates to Remember

Abstract Submission	: 5th August 2021
Full Length Paper Submission	: 12th August 2021
Notifiation of Acceptance	: 5th September 2021
Conference Registration	: 12th September 2021

Registration Details

Paper Presentation : Rs.1000/- (IND), USD 100 (Foreign)
Only Participation : Rs.500/- (IND), USD 50 (Foreign)
Submit your paper to https://easychair.org/cfp/RIACT-2021
Further queries icriact@gmail.com or www.riact.co.in

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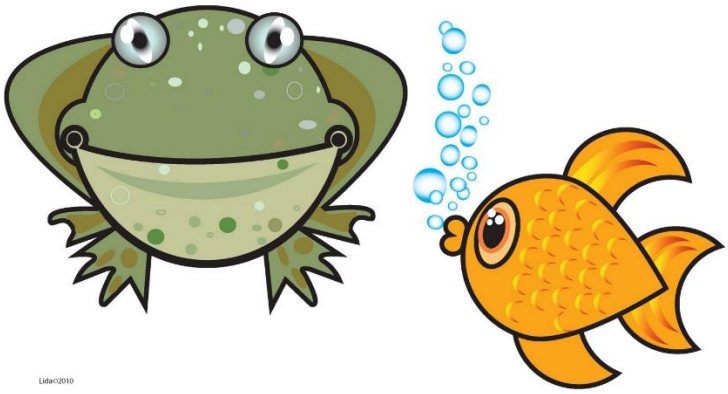
Inspiring Life Stories



When silence speaks

The warty frog and the prize goldfish met one summer afternoon in the temple pool.

"Don't you realize how beautiful I am?" bubbled the goldfish flashing her wispy tail.

The frog made no reply. "I can understand your silence," gloated the goldfish.

"I am not only graceful in my movements but I also enhance the golden rays of the sun."

Again, neither answer or movements from the frog.

"Say something," demanded the goldfish just as a waiting crane speared the sparkling fish and flew into the sky.

"Bye bye," croaked the frog.

Source: Zen Fables For Today

Pic Source: frog+and+fish+[Converted].jpg (1600×1035) (bp.blogspot.com)

Corporate Wisdom

From the desk of Ramki –– Aspire to Inspire

Happy Morning

There was a Leader called David Samson in Usha Computers and he was a shock absorber of all the tensions that prevailed in the organization.

· He use to give back in return peace, tranquillity and composure to the organization.

· He was not the boss that today his mood is out so that everybody will get fired , today he is upset so that the whole organization will be in the state of dullness.

· He was not that kind of boss where today he is happy so that everybody is happy.

· Independent of what was happening in his personal life – ups and downs, in the organization – order received , orders lost , receivable issues, cash flow challenges , people leaving or joining – his personal emotions were never passed on to the team or to the organization or to the people.

· He was such an amazing person despite all the tensions and emotions. Whatever was the stress that is created – by the customers, by the vendors, by bankers he will take it and his team will not know about it. Whatever the stress created by his team he will absorb it and his higher management will never come to know about it. In fact he was the source of peace, tranquillity and composure to the whole organization.

· He was like blotting paper absorbing everything

Mr. David Samson who epitomized "Let problems come from anywhere, solutions will come from me ". Leadership is all about this. Anybody can tell you what is the problem is. Leadership is in saying or working towards the solution. He used to keep saying "There is a way and the way is on the way". Today, tomorrow, through me, through you, through the team, through the market – somewhere the answers or solutions will come. Just because that we are handling a problem today for which we don't have a solution, it does not mean tomorrow also that we will be handling the problem without a solution.

#WishingMostAndMore

Have a wonderful day

R. Ramakrishnan

Email: *r.ramakrishnan@gmrgroup.in*

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