MECHON'17

MECHANICAL ENGINEERING MAGAZINE

MIET ENGINEERING COLLEGE

VOLUME 1
ISSUE 1

MIET
Mohamed Institute of Education & Technology
INSTITUTIONS
Since 1984

MIET ENGINEERING COLLEGE

MECHANICAL MAGAZINE - MECHON '2017

VOLUME NO: 1
ISSUE NO: 1

Er. A. Mohamed Yunus

Chairman

M.I.E.T. Institutions

CHAIRMAN MESSAGE:

It had always been my dream to build an institution for quality, innovation and excellence that can yield success. M.I.E.T. institution was established with a primary motive of providing quality education to the budding youth under privileged as well as the minority community which in turn would translate into service to the humanity in general and to the society in particular.

M.I.E.Tedifythepupiltodreamandrealizethe professional growth in a congenial environment with versatile faculty and facilities while enlightening them with values and characters to attain social, economical and technological growth at global level. Students must strive and create a platform to get a career not just for survival but also to excel in the field. Today is the eraofprivatizationandglobalizationandwetryto groom, nourish and nurture our students to fully equipped pillars of the Nation. My best wishes and blessing to all for the futureendeavors.

Dr. X. Susan Christina

Principal

M.I.E.T. Engineering College

PRINCIPAL MESSAGE:

It is a matter of abiding joy in witnessing a gradual success of our college by tapping the latent potential and talent dormant in the students. We know that quality education is a passport to its steep rise in life and creates a platform for practical avenues.

They pursue their creative interests to attain financial gains and get golden opportunities to lead a life of dignity and prosperity. M.I.E.T Engineering College has efficient faculty members who are endeavored towards framing young and dynamic engineers who will crux of the technical workforce. Best wishes.

Mrs. S. Roseline

HOD

Department of Mechanical Engineering

HEAD OF THE DEPARTMENT MESSAGE:

I am pleased to know that the successful completion of the magazine MECHON for this academicyear2017-18.MECHON,thedepartmental magazine has the prime objective of providing aspiring engineers a wide platform to showcase their technical knowledge and to pen down innovative ideas. This magazine is intended to bring out the hiddenliterarytalentsinthestudentsandteachersto inculcate strong technical skills among them. I congratulate and thank all the students and faculty coordinator who have made untiring efforts to bring out this magazine. I wish them all the very best for releasing more such magazines infuture.

VISION OF THE INSTITUTION

To be a center of excellence in Technical Education through Technical, Ethical and Professional skills for meeting the diverse needs of the Society, in particular Muslim minority community and the Nation.

MISSION OF THE INSTITUTION

To impart Quality Education,Training and Research in the fields of Engineering and Technology.

To provide a conducive learning environment that enables the students to achieve professional and personal growth.

To expose the contemporary issues of society, ethical practices and to create environmental awareness.

To provide the required infrastructural facilities for developing the professional and innovative skills.

VISION OF THE DEPARTMENT

Establish a globally recognized school of Excellence in the field of Mechanical engineering.

MISSION OF THE DEPARTMENT

Impart quality education in Mechanical Engineering through effective teaching-learning techniques.
Provide necessary infrastructure and facilities for the student's personal and professional growth.
Expose to specialized mechanical engineering domains to harness evolving technologies.
Create awareness in ethical practices followed internationally.

DEPARTMENT PROGRAMS

SYMPOSIUM

Mechanical Engineering Department Organized Symposium YANTRA M'18 on 24-02-2018.

- Dr. N. Kulasekharan, Assistant General Manager – Aero/Thermal CFD, Fiat Chrysler Automobiles India Private Limited was the honorable Chief guest for inauguralfunction.
- Dr. U. Natarajan, Professor & Head, Department of Mechanical Engineering, AlagappaChettiarcollegeofEngineeringandTechnology,Karaikudiwasthechief guest for valedictory function and judge for Paper presentationevent.

STUDENTS ARTICLES

1. DESIGN AND ANALYSIS OF HACKSAW ATTACHMENT IN CONVENTIONALLATHE

Lathe is a machine that helps in shaping several material pieces in the desired shapes. A Lathe is a machine that rotates the piece on the axis in order to perform various operations like cutting, facing, knurling, deformation and more. Metal spinning, thermal spraying, woodturning and metalworking are the common operation performed with a lathe machine. One can even shape pottery with this working wonder. Whatever material used in the lathe machine whether metal or wood is molded first. The most commonly used lathes are the woodworking lathes.

A manufacturing world which concentrated on design, product development, production rate and profit now has to focus on human welfare and environment issues due to the fulfillment of statutory requirements and quality aspects. This paved way for the birth of the several approaches for risk assessment and control of occupational hazards. The existing model is made by using face plate without using anymechanism.

The hacksaw attachment is attached directly on the face plate and the cutting operation is performed perpendicular to the center axis of the spindle. In the metal working industry one of the most important issues is the cost of the machines and work space. The project is on the design and construction of a hacksaw attachment in conventional lathe machine. It is a cutting machine with teeth on its blade used especially of the machine were designed and constructed.

By
Praveen Arulraj C, Praveen Kumar A, Praveen N, Mohanakavi D

2. Enhancement of heat transfer using PCM with graphite Nano particles in heatexchanger

Low Temperature Energy Storage System (LTESS) stores the thermal energy from solar, exhaust gases and waste heat from industries and other sources. To achieve this energy storage, the medium adopted is Phase Change Materials (PCM). PCM is preferred because of their higher storage density, with lessvolume.

The disadvantage of PCM for using an LTESS is that, the thermal conductivity of PCM is less and this requires more time period and surface area of contact, for loading and unloading of thermal energy. To overcome this problem, an attempt was made to incorporate Graphite Micro Particle in the paraffin PCM to improve its thermal conductivity.

The heat transfer of LTESS us determined both analytically and experimentally. Incorporating micro-particle in the PCM has improved the heat transfer of the LTESS. Maxwell-Gernett equation is used to determine the heat transfer of PCM analytically and J-Type Temperature measuring Probe and Sensor Apparatus is used to determine the heat transfer experimentally.

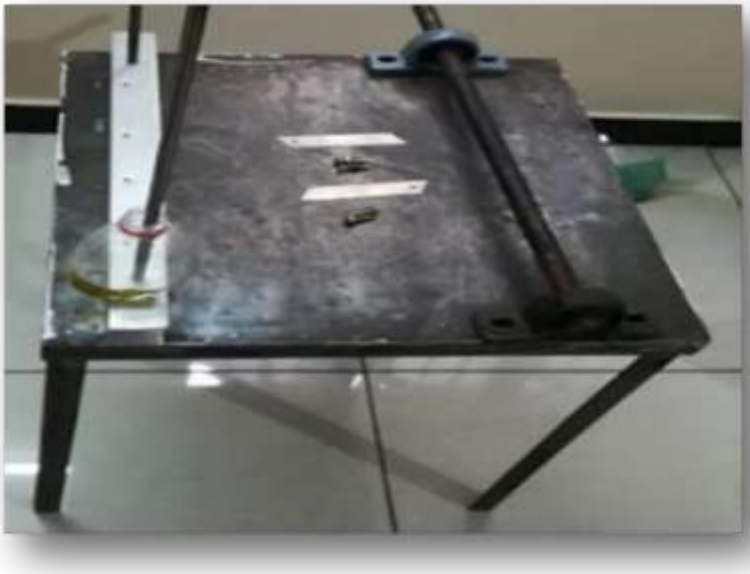
By

Ragesh K, Ragul R, Prasanth V, Punyavrata B

3. DesignandfabricationofPlasticbottlespeelingmachinebyusinghandwheel

Intoday'sworld,theusageofplasticbottlesincreasesbythesamewaynumber of plastic bottles and usage of plastic bottles is growing day by day. The pollution createdbythewastageofplasticbottlesduetoincreasingutilizationistobeaddressed immediately.Reducingtheusageofplasticbottlesisachallengingtaskinnow-a-days. Thealternativetothisproblemistoreusetheplasticbottlesbypeelingthemandmake into a rope. The main objective of peeling the plastic bottles is to reduce the pollution at zero level. Saying about the disadvantage is that the process is slow one because the operation is donemanually.

The main objective of the work is to peel the plastic bottle into a fine string with thehelpofstainless-steelcutterandthenusingthatstringwecanmakearope.Usually theresomeheattreatmentprocessshouldbeheldtomakearopeusingplastics.Here, duetopeelingtheplasticbottlesintoafinestring.Duetothiswecanreducetheplastic bottles wastage and also thepollution.



Bottle peeling machine

By

Gokulakrishnan S, Eniyan V

4. Aerodynamic modification of sedan car by using under tray througha numerical

Aerodynamics is the study of the aerodynamics of road vehicles. Its main goals are reducing drag and wind noise, minimizing noise emission, and preventing undesired lift forces and other causes of aerodynamic instability at high speeds. Air is also considered a fluid in this case. For some classes of racing vehicles, it may also be important to produce downforce to improve traction and thus cornering abilities. Aerodynamics is the study of motion of air around an object or in this case a vehicle. We are concerned with calculation of forces on and around an object.The forces that interests us for this paper are lift anddrag.

Aerodynamics plays a critical role in sedan cars. The work here presented shows a comparative study of difference between without under tray car model and under tray car design model and their influence over the drag force and their co-efficient measured on a sedan car, using CFD simulations in a virtual wind tunnel test. One model without any aero part was taken as base line and then design under tray model proposals were evaluated looking for an aerodynamic improvement. The various wind tunnel test taken at wind velocity at 100 km/hr, 150 km/hr and 200 km/hr. As final results, the drag force and drag co-efficient of the proposals were ranked and compared with base line results. Also pressure, velocity and wake images help to illustrate on the drag force and drag co-efficient by using an under tray in thisvehicle.

By

Uma Shankar M, Ruban P, Elavarasan D, Ahamed Abuthahir M

5.Performance combustion and emission characteristics of mahua oil methyl ester on variable compression ratio dieselengine

Recent survey on the world energy consumption highlights that a major portion of the total energy consumed is derived from the combustion of fossil fuels. Among the fossil fuels, liquid petroleum based fuels contributes a maximum because of their inherent physico-chemical and combustion properties. Unfortunately, the reserves of fossil fuels, specially the liquid fuels are not unlimited and may exhaust,if not utilized economically, within the fewdecades.

This can be achieved by understanding the physicochemical processes involved during the combustion. Such as knowledge is also beneficial in view of propulsion, mitigation of combustion generated pollution and control of fire hazard in handling combustibles.

In the present day Internal Combustion engines are operating essentially on petroleum based fuels, which are non - renewable in nature and lead to depletion in short period due to its indiscriminate use in different fuels. Renewable agriculture based, non – edible oils like Pongamia, Mahua (Madhuca Indica), Neem, Jatropha oils etc. can be used as an alternative fuel in CI engines. Biodiesel production from Mahua seed was experimentally investigated in the present study. Biodiesel made from Mahua oil is an economical source that can effectively reduce raw material cost.

This system is to improve the yields of Mahua oil biodiesel has received little attention in the literature review, experimental results indicate that it outperforms the processes with the best results.

It is found that 1.5 wt. % of Sodium Hydroxide (NaOH) catalyst and 1:6 methanol (CH_3ONa) to oil ratio, it takes above 1 hour at 55 – 60 °C of temperature with rotating speed of 800 rpm respectively are suitable for producing biodiesel at the optimum conditions.

During Transesterification process, the co – solvent is to be added into the reaction performs to increase its yield. The properties of biodiesel were compared to ASTM D6751 standards. From the engine test performance, combustion and emission characteristics on variable compression ratio diesel engine have been studied at various loads.

Mahua seed

By

Sakthivel S, Saravanan M, Sadhique Ahamed M, Silverstalan J

FACULTYARTICLES

1. More Fuel-EfficientRides

Teslaisattheforefrontofthefuel-efficiencymovement,releasingaslewofelectric and hybrid vehicles that can take you for hundreds of miles with a single charge. In 2016, more than 2 million electric vehicles were sold world wide and this figure is expected to rise in the near future as more automotive manufacturers implement electric vehicle technology to theirfold.

Companies such as VW and General Motors have recently unveiled electric cars to their fleet, while Volvo said that all of the engines, they produce will be equipped with an electric motor by 2019.

Fuel efficient car

By

Mr. M. Visvam, Assistant Professor

2. Predictive VehicleTechnology

Artificialintelligence(AI)andmachinelearning(ML)haveanimportantroleinthe future of the automotive industry as predictive capabilities are becoming more prevalent in cars, personalizing the drivingexperience.

More manufacturers are applying algorithms that use data to automate the process of setting up a vehicle, including a car's infotainment system and its application preferences. Vehicles are becoming IoT devices which can connect to smartphones and take voice commands, changing the user interface.

Predictive Vehicle Technology

By

Mr. M. Kirubakaran, Assistant Professor

3. Self-DrivingTechnology

Much has been made of autonomous driving technology, and while some companies have been testing their self-driving functionalities on open roads, we're still quite a ways away from widely adopting these cars.

Several cars already have semi-autonomous capabilities in the form of driver-assisted technologies. These include automatic-braking sensors, motorway lane sensors,mappingtechnologythatmonitorsblindspots,camerasinthebackandfront of a car, adaptive cruise control and self-parkingcapabilities.

Car with self driving Technology

By

Mr. P. Pradeep, Assistant Professor

4. Artificial and 3D-Printed skin Advances for Robots,Human

Skin,thelargestorganinthehumanbodysensestemperature,pressure,and pain. Recent advancements in artificial and 3D-printed skin could soon deliver thosesensations and more to robots, prosthetics, and humans. Today's artificial skin uses sensors, microelectronics, and conductive materials to "feel"sensations.

Scientistsarealsousinghumancellsand3Dprintingtomakehumanskinthat can be used to cover wounds or as a permanent replacement for lost skin. Engineering advances for artificial skin and human skin could even merge in the future, paving the way for "cybernetic" organisms that have both organic and biomechatronic bodyparts.

Artificial Skins

Artificial skin uses sensors to help prosthetics and robotic limbs process sensations and perform tasks with dexterity. But the best artificial skins can only measure one stimulus. Researchers want to create artificial skin that responds to multiple stimuli the way real skin does, creating more functionality. This requires embedded arrays of nanoscale sensors.

Depending on the number of sensors and array density, artificial skin can be hundreds of times more sensitive than human skin. Researchers at Graz University of Technology (TU Graz) in Austria plan to do just that by creating a nanoscale sensor that simultaneously detects temperature, humidity, and pressure.

“These sensors will be made of a smart polymer core which expands depending on the humidity and temperature, and a piezoelectric shell, which produces an electric current when pressure is applied,” said Anna Maria Coclite, Principal Investigator and assistant professor at TU Graz's Institute for Solid State Physics.

These smart cores would be sandwiched between two nanoscale grids of electrodes, which sense the electrical charges given off when the sensors “feel” and then transmit this data. “The idea is that it could be used like robotic hands to sense temperature or even things at a much smaller scale than humans can feel—for example, bacteria,” she says.

Bioprinting Human Skin

Impressive advances are also being made in the 3D printing of human skin in the laboratory.

For example, researchers from Universidad Carlos III de Madrid and Hospital General Universitario in Valencia, Spain, have created a 3D bioprinter that creates totally functional human skin—in its natural layered structure—that is suitable for transplantation. Allogeneic skin is generated from a stock of cells on a large scale; autologous skin is made from an individual’s own cells for therapeutic use, such as treatment for severe burns.

Bioinks using these cellular components are the key to 3D bioprinting healthy, functional skin. "Knowing how to mix the biological components, in what conditions to work with them so that the cells don't deteriorate, and how to correctly deposit the product, is critical to the process,” said researcher Juan Francisco del Cañizo from Hospital General Universitario.

Artificial skin

By

Mrs. S. Roseline, Assistant Professor

5. 3D-printed Lithium-ion Battery Could Power Electric Vehicles,Drones

We rely on lithium-ion batteries every day to charge our smartphones, laptops, and many other electronics. One day they could power our electric vehicles. But the energy-storagecapacity of lithium-ion batteries has struggled to keep up with the surging demands for their use.

Now, engineers at Carnegie Mellon University say they've found a way to significantly extend lithium-ion battery life by using a new method to print 3-D electrodes.

The lattice printing 3-D method could not only extend battery life, it could serve to create batteries made from materials like silicon, which would give the batteries faster recharging times and, when used in electric cars, longer range time. The low-weight and high-energy-capacity batteries the printing method create could also power small, light devices, like drones.

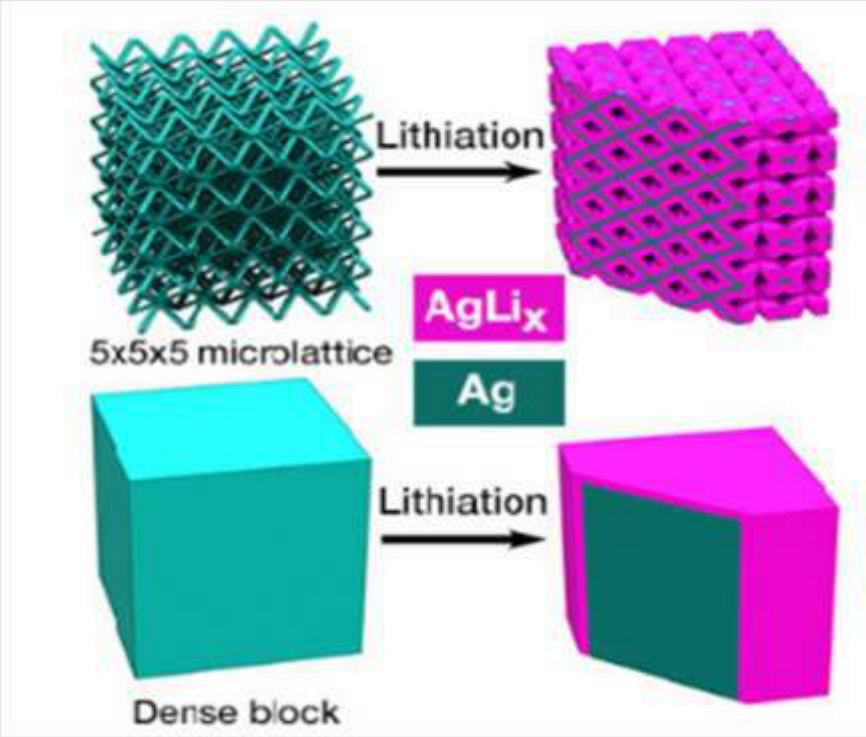
All batteries contain two metal electrodes, a negatively charged anode and the positively charged cathode, separated by a substance called the electrolyte. The Carnegie Mellon team's electrodes are printed using Aerosol Jet technology, which assembles droplets one-by-one to create electrodes with lattice-like, interlaced structures with complex geometries that can be created using the current electrode-printing methods, said Rahul Panat, associate professor of mechanical engineering at the university.

Right now, lithium-ion battery electrodes are 3-D printed through an extrusion method that lays down "fingers" of the material one atop the other to form a solid block of material.Lithium has a hard time penetrating that solid block to charge the electrode, Panatsaid."Lithium has to penetrate throughout volume of electrode for it to be fully utilized," he said.

"In today's commercially available batteries, you have about 30 to 50percent of the lithium used." The chemical, on the other hand, can easily diffused throughout the channels and pores of the latticed electrode to completely saturate the electrode. The researchers have found that lithium saturates 100 percent of the battery's electrode when it's printed using theirtechnique.

Panut worked with Jonghyun Park, an assistant professor of aerospace engineering at Missouri University of Science and Technology to develop the new printing method.

Because it has more energy storage capacity, the latticed electrode can be used to make a smaller battery that still carries the same charging capability of its larger, solid-electrode counterpart. “Or it could make the same-size battery that would hold much more charge,” Panat said.



3D printing lithium ion battery

By

Mr. B. Deepakrajan, Assistant Professor

6. 3D-Printed Cement Improves CrackResistance

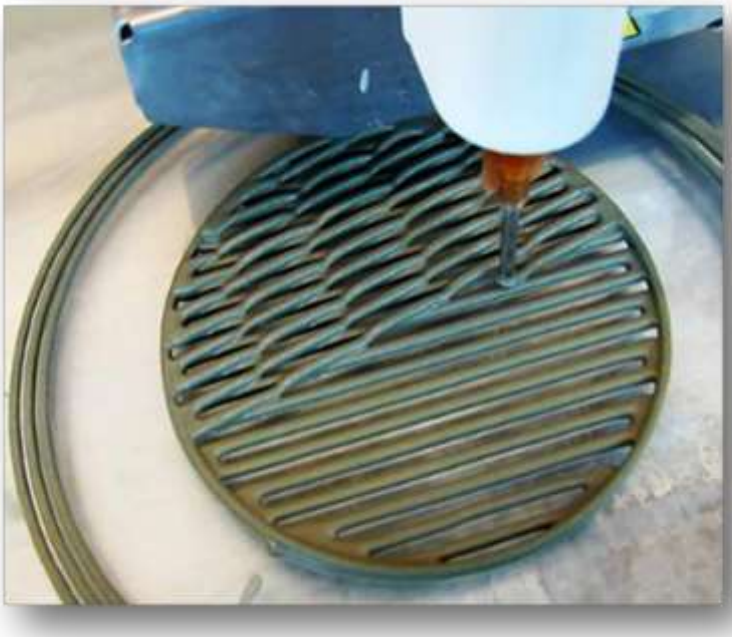
Additive manufacturing of cement-based materials, such as concrete and mortar, is a top research objective in the construction industry, with several start-up's having already shown its feasibility. However, concerns exist about the durability and resilience of such printed structures, in part because the inherent weakness that exists along the interfaces created by the layer-by-layer AM methods, where brittle failure can occur.

Current efforts to solve this problem are focused on strengthening the interfaces through technical improvements to the 3D-printing process. Researchers at Purdue University, however, have taken a different approach. Inspired by novelstructures found in the exoskeletons of arthropods such as lobsters and beetles, the team has successfully 3D-printed hardened cement paste (HCP) that actually controls cracking underload, just like arthropod shells do.

These naturally occurring structural patterns or architectures, generate unique damage-control mechanisms such as interfacial microcracking and crack twisting. That "allows inherently brittle HCP materials to attain flaw tolerant properties and novel performance characteristics," said MohamadrezaMoini, a research team member. "These mechanisms lead to damage delocalization inbrittle 3D-printed architectured HCP, resulting in quasi-brittle behavior, enhanced fracture and damage tolerance, and unique load displacement response, all without sacrificing strength."The team's goal was to 3D-print elements made from cement-based materials that take advantage of unique structures found in arthropod shells to minimize the damage that can spread between printed layers of amaterial.

“The layered structures produced during layer-by-layer printing can result in weak interfaces between those layers,” Moini said. “In turn, these interfaces provide predefined paths for cracks to follow during the loading of the structure. Depending on the architecture and geometry of these interfaces, the growing crack eventually runs into an interface and initiates the growth of other cracks, thus spreading the distribution of damage and delaying damage localization, which ultimately leads to catastrophic failure of the material.”

The most promising architectures fabricated with cement-paste materials include honeycomb, compliant, and Bouligand (helicoidal) structures. Using a 3D-printer and cement-paste materials, HCP elements can be printed to include these fundamental structural patterns. Each architecture results in new behaviors in a 3D-printed element.



3D-Printed Cement

By

Mr. K. Pannerselvam, Assistant Professor

7. Autonomous, Robotic Boat First to Sail Across theAtlantic

Atlantic crossing is not easy, but the little Sailbuoyhas to maneuver past oil platforms, navigate high-traffic areas, and withstand gale force winds without a human hand at the tiller. It took 80 days for Sailbuoy to travel from Newfoundland in Canada to Ireland, becoming the first self-maneuvering boat to complete a transatlantic journey.The rough distance, as the crow flies, is about 2,000 miles, but the sail distance turned out to be about 3,169 miles. The boat experienced smooth sailing and faced no major challenges, said David Peddie, CEO of Offshore Sensing, the Norway-based company that made the boat.

“We were concerned about icebergs and being picked up by fishing boats, so we avoided ship traffic,” Peddie said. “We had some strong currents pushing it backwards, but this only delayed the crossing.”The unpredictable nature of the ocean caused a previous attempt by Sailbuoy, and other groups, at a transatlantic journey to fail.“Last year we only made it halfway.

The reason for this was a screw that came loose and shorted an electrical connection disabling the autopilot,” Peddie said. “We forgot to lock it securely.“One doesn’t know what one might hit, one can get tangled in nets or floating debris, get smashed by a whale, chewed on by a shark or maybe something else,” Peddie added. “This is quite rare, but you never know.”TheSailbuoy used wind for propulsion and solar panels for power. Unlike autonomous cars, the boat didn’t usecameras for obstacle detection or navigation.

Instead, it used GPS and sensors to find its position, heading, and speed. The boat transmits data to and from shore in real time using the Iridium satellite system.It is designed for a handful of applications, such as measuring ocean and atmospheric parameters, fishery management, aquaculture, tracking oil spills, and serving as a communication relay station for subsea instrumentation.

During its recent journey, the robotic boat received waypoints toward which it was to travel via the satellite network. The Sailbuoy navigated to each waypoint without human intervention. Sailbuoy sails in much the same way as a traditional sailboat, tacking to make headway against the wind and to approach a particular waypoint.

By

Dr. S. Thiyarajan, Assistant Professor

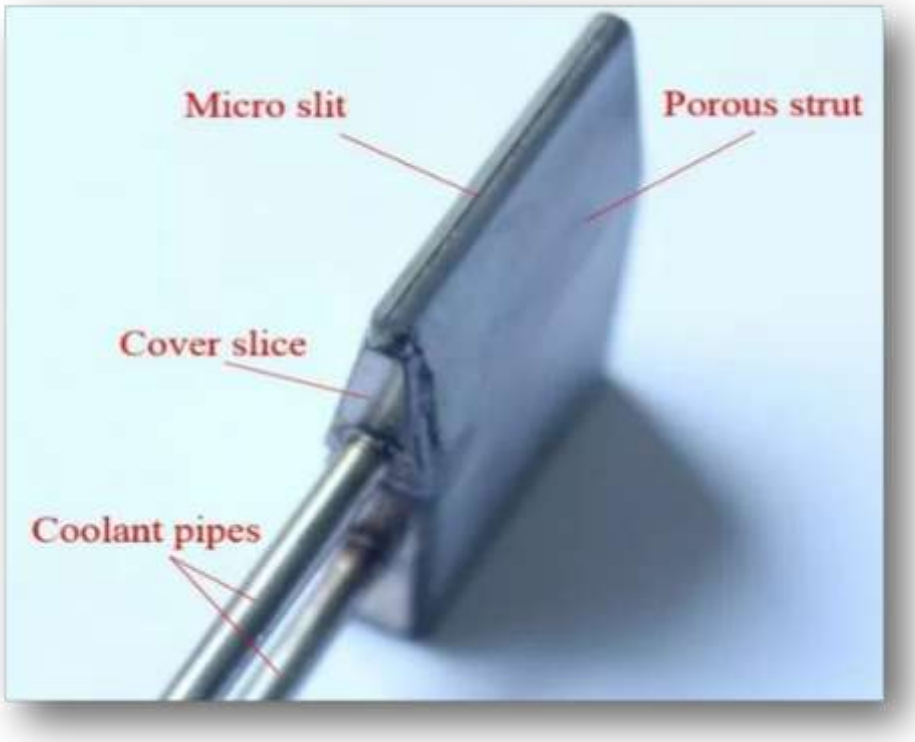
8. A Breakthrough of Cooling Method for Leading Edge Structuresin SupersonicFlow

Thrust imparting forward motion to an object, as a reaction to the rearward expulsion of a high-velocity liquid or gaseous stream can be effectively employed in jet propulsion.Air rushing toward the inlet of an engine flying at high speeds is partially compressed by the so-called ram effect. Ramjets that operate at supersonic speeds are often called scramjets. Scramjets are considered to be among the most promising power systems for hypersonic vehicles since their specific thrust is larger than that of any other propulsion system in the hypersonic flight regime when the Mach number is higher than 6.

However, these systems are faced with a critical drawback in that the heat sink for the fuel consumed by hypersonic vehicle does not provide sufficient cooling at higher Mach numbers, which leads to a rapid increase in the heat loads. Despite the numerous studies regarding this issue, a concrete solution is yet to be arrived at and it is therefore imperative that an efficient cooling technique that will offer protection to the struts used when the hypersonic vehicles are operated at higher Mach numbers be developed.

Recently, a team of researchers (Dr. Gan Huang, Dr. Yinhai Zhu, Dr. Zhiyuan Liao, Dr. Taojie Lu) led by professor Pei-Xue Jiang from the Key Laboratory for Thermal Science and Power Engineering of Ministry of Education at Tsinghua University in collaboration with Zheng Huang from China State Shipbuilding Corporation in China investigated a combined transpiration and opposing jet cooling technique for protecting porous struts with micro-slits in the leading edge. They hoped to provide a breakthrough by developing an improved strut structure for better cooling efficiency. Their work is currently published in the research journal, Journal of Heat Transfer.

The researchers began their studies by identifying and adjusting a supersonic wind tunnel test facility to match their desired standards. Next, they prepared a physical model of the porous strut structures to be examined in the study. They then connected the test sections with the Laval nozzle section and used it to investigate the heat transfer of the struts. Eventually, the temperature distribution on the porous strut surfaces was measured using an infrared thermal imaging instrument.



Combined transpiration and opposing jet cooling structure

From the Schlieren images taken, the researchers observed that their cooling technique considerably affected the stability of the flow field and the profile of the detached shock wave. Additionally, they recorded three different states of flow fields when increasing the coolant injection pressure of a strut having a 0.20 mm wide micro-slit.

More so, it was also seen that the detached bow shock was pushed away by the opposing jet; after which it then became unstable and even disappeared when the coolant injection pressure was increased. In their work, Pei-Xue Jiang and colleagues presented an empirical investigation of the combined transpiration and opposing jet cooling for sintered stainless steel porous struts. The results presented indicated that the combined opposing jet cooling and transpiration cooling had a significant influence on the flow field.

In addition, their work highlighted that the combined opposing jet and transpiration cooling was more effective than pure transpiration cooling for cooling the strut. All in all, the combined transpiration and opposing jet cooling with nonuniform injection made the temperature distribution uniform and caused the maximum temperature to decrease, which is a novel and effective technology to cool leading edge structures in the supersonic flow and reduce the thermal stress. It is of great significance to thermal protection system for spacecraft.

By

Mr. I. Devaraj, Assistant Professor

9. First observations of pseudo-ductility in three-point bending tests on CFRP angle-plylaminates

Excellent torsional stiffness generated by angle-ply laminates at ±45° configurations favor their wide applicability in the industry, while in laboratories it is commonly used for the purposes of determining material in-plane shear properties due to the relative simplicity of the tensile test method applied. When it comes to uniaxial testing, the ±45° angle-ply laminates at times develop pseudo-ductile effects.

Pseudo-ductility could be sought in composite structures to avoid their brittle behavior and, consequently, to withstand higher levels of external loading due to an extended non-linear response. Presently, there exists a plethora of literature regarding the angle-ply laminates submitted to uniaxial tests.

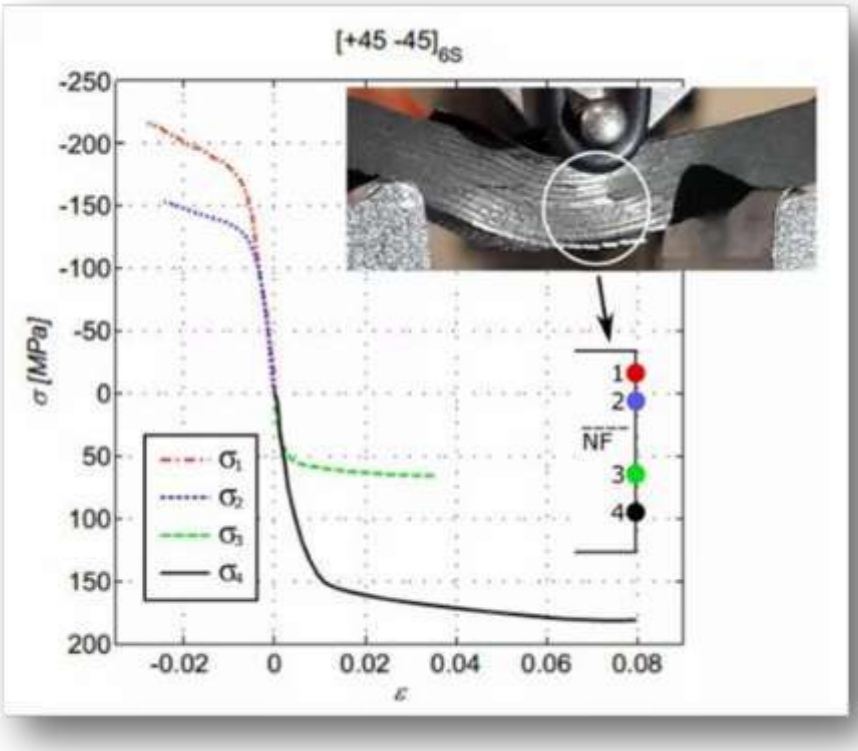
Nevertheless, the pseudo-ductile effects appear also under flexural loading because tension and compression are applied in different regions of the cross-sections simultaneously.In this sense, bending testing presents a higher degree of complexity introduced by the variation of the strain through the cross-section thickness. Therefore, there is need, urge and drive to comprehend pseudo-ductile flexural response of symmetric ±45° angle-ply laminates as flexion is a very frequent loading case in structures under working conditions.

Recently, a team of researchers from the University of Castilla-La Mancha in Spain investigated the three-point bending response of symmetric ±45° angle-ply laminates built with unidirectional and continuous carbon fiber-reinforced epoxy laminae. They purposed to cross-examine the pseudo-ductile effects considering that pseudo-ductility refers to the non-linearity driven by the accumulation of damage and yielding of the matrix that favors the fiber reorientation.

Their work is currently published in the research journal, Composites Science and Technology. For the purposes of their work, the research technique utilized entailed evaluation of the classical laminated plate theory in order to quantify the coupling of forces based on the theoretical knowledge of the neutral axis deviation and the different material behavior under tension and compression. Next, Serna Moreno and colleagues tested the proposed laminates in order to verify the correctness of the analytical predictions acquiring the displacement and strain fields by means of Digital Image Correlation techniques. In addition, optical visualization and Scanning Electron Microscopy were employed in order to assess experimentally the first failure modeinduced.

By comparing the effects of the pseudo-ductility in flexural testing and the experimental response of both laminates, the researchers observed that similar in-plane linear response were recorded. Additionally, it was also seen that the main differences in the mechanical response could be attributed to the stacking sequence, as the effective ply-thickness in the first sample was half that of the alternate laminate.

Finally, the researchers were able to develop analytical predictions of different parameters of the linear response by considering the different tensile and compressive mechanical performance of the material, as well as the numerical optimal design of the stacking sequences that reduce the bending-twisting coupling and increase the pseudo-ductile effect.



Pseudo-ductility in three-point bending tests on CFRP angle-ply laminates

The present study concludes an excellent investigation of the flexural response of [+45 -45]6S and [+452 -452]3S laminates. In so doing, they discovered that similar linear behavior was eminent for the two samples, but different non-linear phases. Altogether, it has been shown in this work that it is possible to remove the inherent limitation and enlarge the design space by using thin ply angle-ply laminates that exhibit a non-linear 'pseudo-ductile' stress-strain response.

By

Mr. D. Manikandan, Assistant Professor

10. SMARTENYOURSELF

"There are 3,345 Engineering colleges in India, out of which 1.5 million engineersgraduateeveryyear.Totopitall,therearenotevenenoughcompanies to accommodate this 1.5million."

What did you decipher from the above said statements? Do they sound scary? Well, you should be scared only if you have Numerophobia- fear of numbers; for these stats are mere numbers and you should never let thesedefine you or your future. There is always a huge demand for smart people. How do you know if you're smart or what should you do to become smart? Know what you want. Analyse yourself and find out what you're goodat.

Be it turbines, transformers, integrated circuits, coding, management, marketing, designing or writing that interest you, train yourself in the field you like, for there are millions of companies out there waiting to hire you for anything and everything you're good at.

Makesureyoufocusonwhatyou’reaimingfor.Whatifyoudon’tknowwhat youwantorwhatyou’regoodat?Grabtheopportunitiesthatcomeyourway.Enter every possible door that opens out to you, and then try and give yourbest.

Once you are ready, you would submit your applications and give interviews. It is very important for you to know what you should and should not do in an interview.Dressproperly,beconfident,greetyourinterviewerwithasmile,sitafter they ask you do so and the etcetera, are iterated and reiterated a thousand times. Though all these are also vital, let us, for now, walk away from these clichés and talk more about what others you shoulddo.

1. Beingconfidentisgood.Beingoverconfidentisnot.Ifyouactoverconfident, you are likely to lose the confidence of youremployer.
2. Look into the eyes of your interviewer while talking. Looking elsewhere is definitely not going to help.
3. Donotbecomedesperateforthejob,oratttheleastdonotshowcaseit.

Here’s an example:

Interviewer: Are you willing to work on weekends or take up night shifts?

Candidate: Yes sir, I can work for you and your company at any time and any day.

Thiswillevidentlyshowyouremployerthatyouareverybadlyinneedforajob. This answer is still good if you are actually willing to work any day and any time. This might probably get you the job but do remember if you set up expectation at the very beginning, you will have to keep up to that expectation for the rest of your daysthere.

4. Never lie; neither in your resume nor in your personalinterview.

5. Keep your tone formal. Also remember, adding sir/madam in every sentence is not being formal. Your thoughts and speech should be formal and mature.
6. Get a thorough knowledge about the company and the post you're applyingfor. You should be able to answer any question based on that.
7. Talk to the point. There is no use beating around thebush.
8. Be spontaneous. Do not make up your own answers. If you do not have any answer, it is always better that you justapologies.
9. Prepare a few questions about your role or the company, so you can ask back the interviewer once they are done with theirquestions.

By

Mrs. S. Roseline, Assistant Professor

11. CHALLENGES OF TEACHERS IN THE 21ST CENTURY

Doesn't it strike us that before us there lies a fruit (of knowledge) which is being focused by greedy as well as hungry eyes, ready to be grabbed by two different categories of million hands, and we could do very little about it. The air is heavy:eachoneofuscouldfeeltheintensityofdoingjusticetotheprofession-To sharethefruitequallybetweenthetwogreatestbutcontrastingcommunitiesofthe nation.

The first – the established and the creamy layer, who are extreme curious to have access to global knowledge to capture the whole world with their imagination,togivetheircontributiontoNASA&SiliconValleyandmakethehearts swellwithpride,happilyneglectingthemoral,ethicalandhumanisticvaluesintheir frenzied pursuit of success, resulted in serious man-madecrisis.

Sadly – The second – About 480 million children, the world largest population – who don't have a bright future to which they can look forward with confidence, who don't even acknowledge that they are denied with what they deserve. To them, the moral, ethical and humanistic values are of least importance as they feel that they do nothing to enhance their livelihoods.

This clash "*Well fed*" versus "*Under fed*" pose a great threat to the present society and the entire focus is now turned towards the 'Teachers' – who are supposed to tackle this greatest challenge of the century. Neutralizing the differences without any compromise in upholding ethical, moral and humanistic values is the need of the hour and that is what our 'Z' Generation of super power India looks for.

By

Mr. A. Pandianathan, Assistant Professor

12. YOUR(SELF)

Once upon a time, there was a cobbler who was very busy.

He lived in a large village and was the only cobbler in town, so he was responsible for repairing the boots of everybody else.

However, he didn't have time to repair his own boots.

This wasn't a problem at first, but over time, his boots began to deteriorate and fall apart.

While he worked feverishly on the boots of everyone else, his feet got blisters and he started to limp.

His customers started to worry about him, but he reassured them that everything was OK.

However, after a few years, the cobbler's feet were so injured that he could no longer work and no-one's boots got repaired. As a consequence, soon the entire town started to limp in pain, all because the cobbler never took the time to repair his own boots.

I wrote this to illustrate a simple principle that is so often disregarded.

If you don't look after yourself, after a while you'll be no good to anyone else either. Your best intentions will mean nothing and you'll be unable to do what you're meant to do.

This goes for pastors, leaders, social workers, teachers' even parents.

If you don't take the time to care for yourself, no-one else will.

I'm not talking about living a self-absorbed existence.

I'm talking about making sure that you have the energy and focus required to sustain your performance in the years ahead.

I'm talking about fixing your boots.

Are you looking after yourself?

If you keep going without making any changes, will you eventually burn-out?

By

Mr. P.SUNDARAM, Assistant Professor

13. SelfConfidence

Self Confidence is the key to success, or we can say the first step to success.Ifapersonhasselfconfidence,hehaswonhalfthebattle.Thosepeople who have self confidence at work, school, and in their daily life always appear on top of world. Everything seems to go right for these people and they always seem to present themselves as calm, collected and successful in everything theydo.

Ifyoupayattention,youmightnoticethattheseselfconfidentpeopleusually are successful in every area of their lives. Is this because they are smarter? Or is it because they have more money? Maybe they are just lucky? The reality is that none of these things are true. Self confident people understand the impact of believing in themselves and relying on theirabilities.

This confidence ultimately creates opportunities for success and with each new success, another self confidence building block is put into place. Success builds self confidence with each new achievement. Self confident people perceive themselves as able to achieve those things they set out to do and this perception creates reality in their lives.

By

Dr. C. Ahilan, Professor

RIDDLES

1. Going To HighPlaces

My invention makes it easier for people to get to high places without climbing stairs. What did I invent?

Answer: The elevator. Invented by Alexander Miles

2. Keeping YouCool

My name is Frederick McKinley Jones, and I invented the machine that keeps you nice and cool on hot summer days. What did I invent?

Answer: Air conditioner

3. An UnpopularInvention

My invention is not very popular with people who visit the doctor. It is pointy and sometimes makes people cry. Who am I and what did I invent?

Phil Brooks, the disposable needle

4. Lawn MowerRiddle

My invention makes cutting grass easier. The modern lawn mower. Who am I?

John Albert "L.A." Burr

PHOTO IMAGES OF THE EVENTS HELD

SYMPOSIUM PHOTOS

Dr. X. Susan Christina, Principal, MIET Engineering College delivering the Felicitation address

Dr. T. Karthikeyan, Director (P & D), MIET Engineering College delivering the Felicitation address

Mr. M. Hashir, Final Year Mechanical Engineering student delivering the Department report

Dr. N. Kulasekharan, Chief Guest, delivering the Inaugural address

Active participants in Paper presentation event

Dr. U. Natarajan, Chief Guest, addressing the gathering in the Valedictory function

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