ASPIRE

Achievements in Sports, Projects, Industry, Research and Education

Monthly Newsletter

Department of Mechanical Engineering

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Sri Sivasubramaniya Nadar College of Engineering

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

SSN

From The HOD's Desk...

Dear all,

It gives us immense pleasure to bring you the latest edition of our department new letter – Aspire.

We profile Marconi whose name is synonymous with the invention of the wireless telegraph, an invention that has been the guiding star for several groundbreaking pathways of wireless communications, across lands and seas.

In campus update we profile the achievements of Benediction Rohit of First year Civil who makes SSN proud with his medals in national swimming events. Heartening to see the continuous publications of our department faculty in good journals in trending research areas and high impact factors. Congrats to Dr S. Rajkumar and Dr N. Lakshmi Narasimhan for bagging external funded projects. SSN and HCL had deliberations on mutually beneficial areas, and they have shown an eagerness to collaborate in Service Robotics.

The ASM students' chapter was successfully inaugurated, and this marks a new beginning in our efforts to network with the materials world. Our students visited TI Diamond chain and Turbo energy and learnt how the wheels of an Industry function to create the products and services we encounter. Glad to see the student achievements in extracurricular activities and the good global positions occupied by our alumni in marquee companies like Amazon and Bosch, USA.

I Had an opportunity to visit the NSS camp in Thiruporur village along with my colleague and see the tireless efforts of the student volunteers spearheaded by the faculty coordinators, in making a difference to the lives of children.

I hope you will enjoy reading this edition of Aspire and keep us motivated to bring you more from the Mech family!

Have a great month ahead full of joy and liveliness.

Best wishes,

K.S. Vijay Sekar | *vijaysekarks@ssn.edu.in*

Guglielmo Marconi: Spearhead of the wireless world

"Every day sees humanity more victorious in the struggle with space and time"

Guglielmo Marconi was an Italian physicist and inventor of a successful wireless telegraph. In 1909 he received the Nobel Prize for Physics, which he shared with German physicist Ferdinand Braun. He later worked on the development of shortwave wireless communication, which constitutes the basis of nearly all modern long-distance radio.

Educated first in Bologna and later in Florence, Marconi then went to the technical school in Leghorn, where, in studying physics, he had every opportunity for investigating electromagnetic wave technique, following the earlier mathematical work of James Clerk Maxwell and the experiments of Heinrich Hertz, who first produced and transmitted radio waves, and Sir Oliver Lodge, who conducted research on lightning and electricity.

In 1894 Marconi began experimenting at his father's estate near Bologna, using comparatively crude apparatuses: an induction coil for increasing voltages, with a spark discharger controlled by a Morse key at the sending end and a simple coherer (a device designed to detect radio waves) at the receiver. During this period he also conducted simple experiments with reflectors around the aerial to concentrate the radiated electrical energy into a beam instead of spreading it in all directions. The range of signaling was thus increased to about 2.4 km, enough to convince Marconi of the potentialities of this new system of communication. Improvements over this newfound method and with help from his cousin, a practicing engineer, Marconi founded the Wireless Telegraph and Signal Company, Ltd.

Marconi's great triumph was, however, yet to come. In spite of the opinion expressed by some distinguished mathematicians that the curvature of the Earth would limit practical communication by means of electric waves to a distance of 161–322 km, Marconi succeeded in December 1901 in receiving at St. John's, Newfoundland, signals transmitted across the Atlantic Ocean from Poldhu in Cornwall, England. This achievement created an immense sensation in every part of the civilized world, and, though much remained to be learned about the laws of propagation of radio waves around the Earth and through the atmosphere, it was the starting point of the vast development of radio communications, broadcasting, and navigation services that took place in the next 50 years, in much of which Marconi himself continued to play an important part.

Campus Update

KHELO INDIA UNIVERSITY SWIMMING CHAMPION

Benediction Rohit of SSN (I Year Civil Engineering) represented Anna University and won 5 Medal in National level KHELO INDIA UNIVERSITY GAMES 2022 SWIMMING

Medals achieved by Rohit in Khelo India University Nationals are

- 1 gold in 4×100 Medley relay
- 3 silvers in (i)200 IM , (ii)50 Butterfly (iii)4×100 Freestyle relay
- 1 bronze in 100 Backstroke

It's a proud moment for SSN. Anna University finished fourth position overall.

RANK	UNIVERSITY				TOTAL
1	JAIN UNIVERSITY	16	5	3	24
2	PANJAB UNIVERSITY	9	5	13	27
3	UNIVERSITY OF MUMBAI	6	6	4	16
4	ANNA UNIVERSITY	6	3	3	12
5	SAVITRIBAI PHULE UNIVERSITY, PUNE	5	9	10	24
6	UNIVERSITY OF MADRAS	5	5	1	11
7	SHIVAJI UNIVERSITY	5	1	3	9
8	LOVELY PROFESSIONAL UNIVERSITY, PB	4	5	4	13

INTRODUCING B.SC. ECONOMICS (DATA SCIENCE) AT SHIV NADAR UNIVERSITY CHENNAI!

This programme offers a holistic amalgamation of Economics and statistical knowledge, equipping the students with the latest skills of 21st Century.

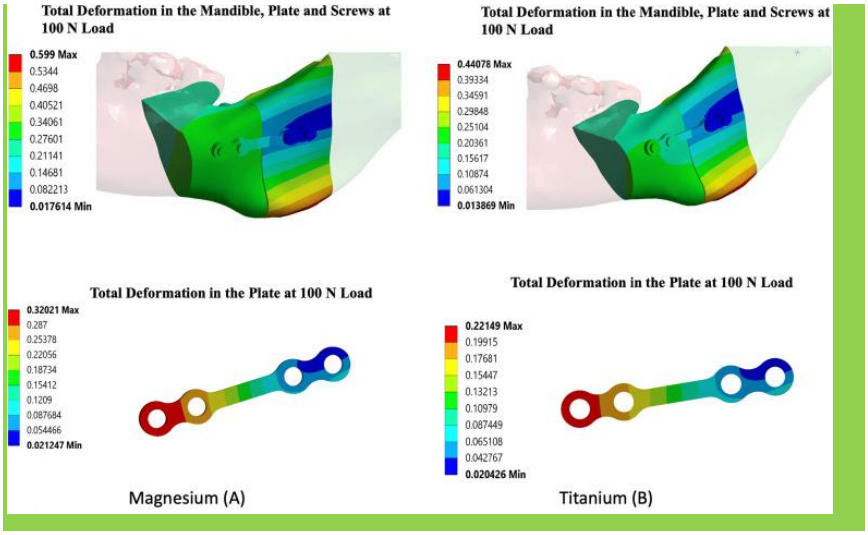
SHIV NADAR UNIVERSITY FITNESS CENTRE

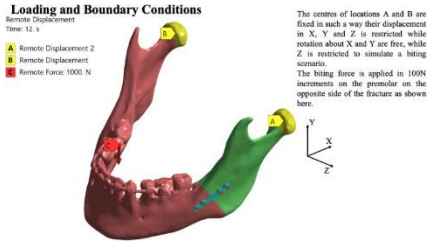
Cultivating a healthy relationship with fitness is of prime importance during academic life with state-of-the-art equipment and world-class infrastructure, the facility provides ample space for wellness & recreation.

Department Update

International Journal Publication - SCI /Clarivate Indexed

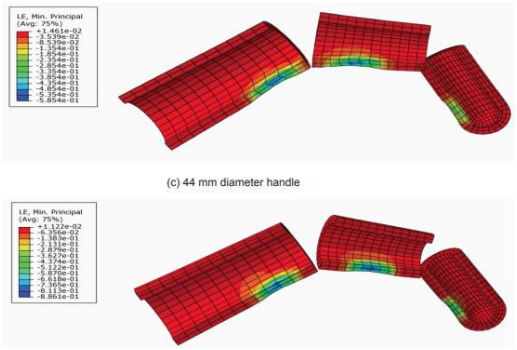
Prasadh S, Krishnan Anirudh V, Lim CY, Gupta M, Wong R. Titanium versus Magnesium plates for unilateral mandibular angle fracture fixation: Biomechanical evaluation using 3-dimensional finite element analysis. Journal of Materials Research and Technology. 2022 Mar 23. Impact factor: 5.039





International Journal Publication - SCI /Clarivate Indexed

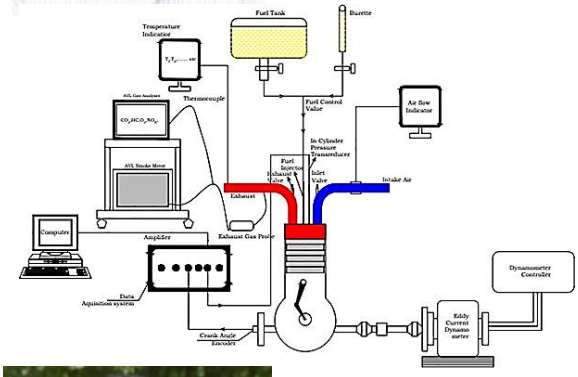
Jain AR Tony and Alphin M S, Evaluation of the bio-dynamic response of the hand-arm system and hand-tool designs - A brief review, International Journal of Occupational Safety and Ergonomics, Volume 28, Issue 1, 10.1080/10803548.2022.2060587, 2022. Impact factor: 2.141

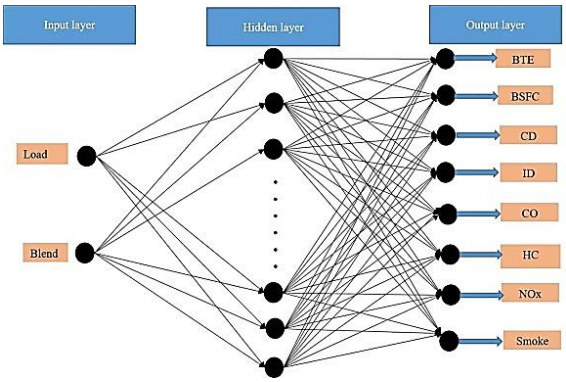


International Journal Publication - SCI /Clarivate Indexed

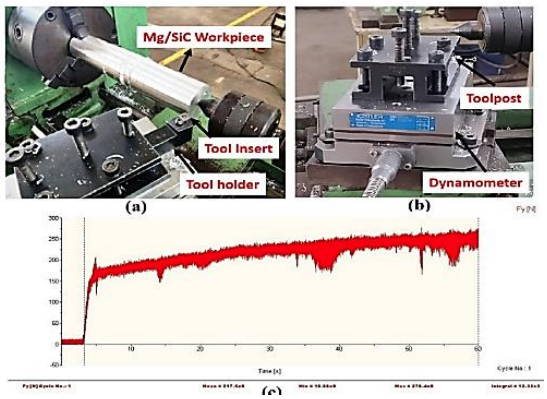
K.M. Muthukrishnan, G. Selvakumar, P. Narayanasamy and P. Ravindran , Characterization of Raw and Alkali Treated Cellulosic Filler Isolated from Putranjiva roxburghii W. Seed Shell Roadside Vegetative Residues, Journal of Natural Fibers, 19 (4) - 1to12, https://doi.org/10.1080/15440478.2022.2061670 , 2022. Impact factor: 5.323

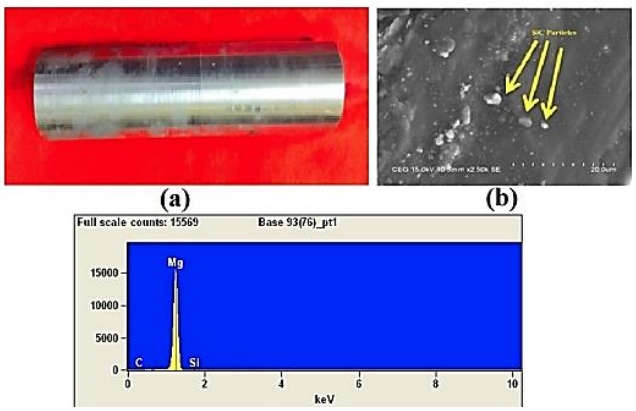
Naik BD, Meivelu U, Thangarasu Vinoth, Annamalai S, Sivasankaralingam V. Experimental and empirical analysis of a diesel engine fuelled with ternary blends of diesel, waste cooking sunflower oil biodiesel and diethyl ether. Fuel. https://doi.org/10.1016/j.fuel.2022.123961, Jul 2022. Impact Factor: 6.609





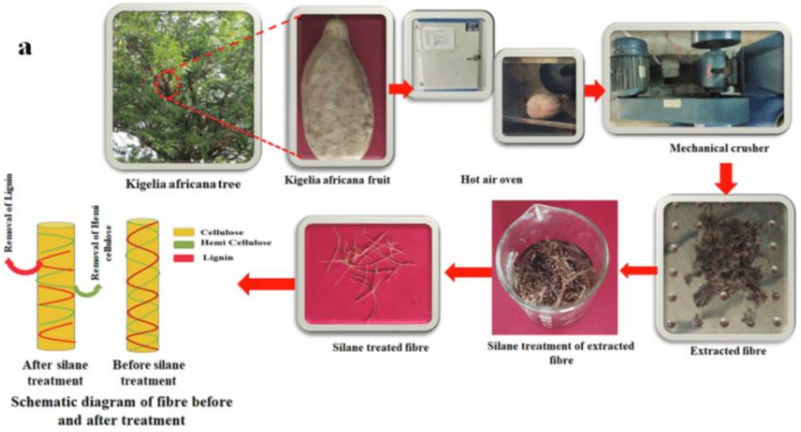
K.Gobivel and K.S.Vijay Sekar , Machinability Studies on the Turning of Magnesium Metal Matrix Composites, Archives of metallurgy and materials, Vol. 67 (3), 939-948. DOI: https://doi.org/10.24425/amm.2022.139686 , 2022, Impact Factor:0.767

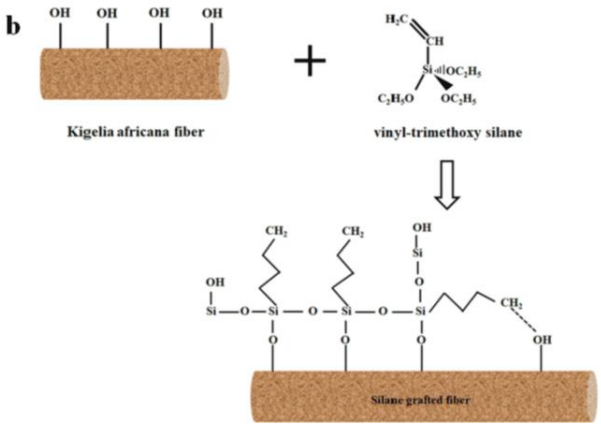




International Journal Publication - SCI /Clarivate Indexed

K. Vishal, K. Rajkumar, M. S. Nitin, P. Sabarinathan , Kigelia africana fruit biofibre polysaccharide extraction and biofibre development by silane chemical treatment, International Journal of Biological Macromolecules, 209 (2022), 1248–1259, 2022 Impact Factor: 7





Scopus Publication

M.Nalla Mohamed , An insight to improve crushing energy absorption capacity of cylindrical tubes using corrugation under axial compression loading, Materials Today: Proceedings, doi.org/10.1016/j.matpr.2022.04.003, 2022

M.Nalla Mohamed and G.VR.Sakthivel , Effect of stitching on improving the tensile strength of sisal fabric/epoxy composites for internal bone plate applications, Materials Today: Proceedings, doi.org/10.1016/j.matpr.2022.04.070, 2022

Project Sanctioned

Dr. N. Lakshmi Narasimhan, got an external Industry funding for Rs. 1,50,000 for the project Titled, Design and Development of a Thermal Chamber, from M/s. Srushty Global Solutions Pvt. Ltd., Chennai-97.

External Funded Project Applied

Project Title: Design, Development and Testing of Novel Minichannel Cold Plates For Lithium-Ion Battery Cooling, PI: Dr. N. Lakshmi Narasimhan, Associate Prof/Mech, Total Budget: INR 4,90,000/- Funding Agency: TNSCST. Date of Proposal Submission: 8.3.2022.

Dr. Satheesh Kumar Gopal as the Principal Investigator and Dr. M. Dhanalakshmi (Bio-Medical), Dr. P. Vijayalakshmi (ECE) as the Co- Investigators, along with & Dr. P. Rajini kumar of Tamilnadu Physical Education and Sports University have submitted a proposal titled "A powered EMG-based embedded system controlled transfemoral prosthesis", to the CRG scheme for an amount of Rs. 40,45,690/-.

Harnessing energy from urban solid/liquid waste using integrated thermochemical-esterification process and its use in diesel engine under low-temperature combustion technology, PI: Dr.R.Prakash ASP/Mech., Co-PI: Dr.T.Vinoth, AP/Mech., and Dr. A. Santhoshkumar, AP/Mech., Kongu Engineering College

Project Title: Studies on Thermal Runaway /Thermal Propagation in Lithium-Ion Batteries, PI: Dr. N. Lakshmi Narasimhan, ASP/Mech, Co-PI1:Dr. K. Rajkumar, ASP/Mech and Co-PI2: Dr. V. Raghavan, Prof., Dept. of Mech. Engg., IIT Madras, Total Budget: INR 37,62,000. Funding Agency: DST-SERB under CRG Scheme. Date of Submission: 16.4.2022

Project Title: Experimental studies on 3 stage filtration based SSLC - DOAS system ,PI: Dr. A. S. Ramana/Asso. Prof./Mech., Co-PI :Dr. M.Suresh / Asso. Prof./Mech. Total Budget (INR): 30,34,000. Funding Agency: DST SERB

Experimental investigation on impact initiation of nanoscaled Metastable Interstitial Composites (MICs) for low impact energy pyro applications. PI:Dr.M.Nalla Mohamed/ASP/Mech, Total budget:25 lakhs, Funding Agency:ISRO

"Enhance the cutting performance of Nickel-based super alloys using integrated cryotreated carbide inserts under cryogenic cooling with multi-jets, Dr. M. Dhananchezian/ASP, 44,59,400, SERB-Core Research Grant"

Faculty Write-Up

External funded project sanctioned to Dr. S. Rajkumar

The external funded project submitted by Dr. S. Rajkumar, Associate Professor, got sanctioned by AICTE under Research Promotion Scheme (RPS) for an amount of Rs. 14.54 lacs. The details of the project are as follows:

Title of Project: Upgradation of Municipal Solid Wastes into Commercial Grade Fuel using Co-Liquefaction and study of its Performance and Emission characteristics on Dual Fuel Compression Ignition Engine.

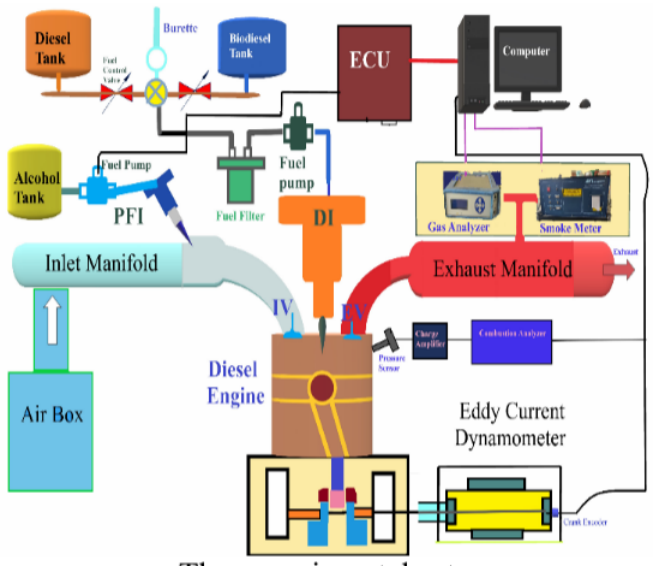
Significance of the project: This proposed work is a first attempt to convert the mixed non-segregated municipal wastes into commercial grade fuel in a two-step process. This work is interdisciplinary research which will enable the fuel to be tested in engines for compatibility and performance analysis.

Project Duration: 3 years (from 08.03.22 to 07.03.25)

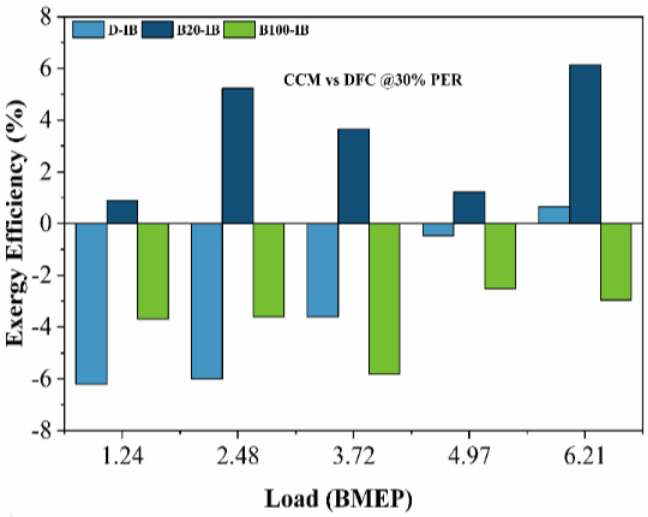
Publication with Full-time research scholar in "Energy", Elsevier with 7.147 Clarivate Analytics Impact Factor

M. Gowthama Krishnan and S. Rajkumar, "Effects of dual fuel combustion on performance, emission and energy-exergy characteristics of diesel engine fuelled with diesel-isobutanol and biodiesel-isobutanol", Energy, 2022; 252:124022.

doi: https://doi.org/10.1016/j.energy.2022.124022 This paper can be downloaded at https://authors.elsevier.com/a/1ezg-1H%7Ec%7EHrUa



The experimental setup



Relative change of exergy efficiency in DFC with respect to CCM at 30% PER

This experimental study investigates the effects of dual fuel combustion (DFC) of isobutanol on performance, emission, and energy-exergy characteristics of an off-road diesel engine using diesel and waste cooking oil biodiesel. The isobutanol is port injected at the premixed energy ratio (PER) of 10, 20, and 30% with intake air, while diesel, B20, and B100 are the direct in-cylinder injected fuels. The experiments indicated an improved brake thermal efficiency in DFC of diesel and B20 (1.22 and 5.27%) than their CCM (conventional combustion mode) at rated loads. The carbon monoxide emission from DFC is reduced than CCM at rated loads except B100. The DFC reduced the nitrogen-oxides (NOx) emission than CCM up to intermediate loads (60%). Compared to CCM, smoke emission at the rated load is lowered by 10.15%, 22.12%, and 7.40% in the DFC of diesel, B20, and B100 respectively at 30% PER.

At 30% PER, the exergy efficiency of DFC of B20 is increased by 0.91, 5.23, 3.65, 1.22, and 6.14% from 20% to 100% loads compared to its CCM. Overall, the DFC of B20-isobutanol with 30% PER is observed to be a better choice in terms of improved performance, NOx and smoke emissions, and exergy efficiency.

NSS Camp visit in Thiruporur Village School

Prof. K.S. Vijay Sekar reports…

I had an opportunity to visit the NSS camp organised by our college in a government school in Thiruporur accompanied by my colleague Dr. G. Satheesh Kumar. The moment I received the invite from the NSS volunteer, I extended my wish to witness the camp and pass on our well wishes to them.

At the camp we got to see the tireless work of our student volunteers, guided ably by Faculty coordinators Dr. P. Kaythry, Dr. W. Jino Hans and Dr. P. Sangeetha, in cleaning up the entire premises, painting the school walls a spotless white, redoing an entire classroom board, providing drinking water RO facility, planting saplings and fixing wall cracks.

In an interaction with these passionate students, we could discover vibrant citizens of the morrow, who could change the face of society and make a difference to villages and children of lesser privileges.

The endeavor to put a smile on the faces of the kids is an act of godliness and hats off to the entire SSN NSS team which like the abbreviations themselves hold a mirror to the rest of us to do our part unflinchingly. As we made our way back from the camp, we imagined a tomorrow that could be a better place, if we could help each other grow with dignity.

Life's best lessons are learnt not at the head of success, but at the feet of labor!!! And this Camp is testimony to that!!!Best wishes from Mechanical to NSS Faculty coordinators and students!!

Report on industrial visit

By B Suresh Krishnan (ME Manufacturing Department)

An industrial visit has been arranged by our department at TI Diamond Chain on 12-03-2022. Ten PG students and one faculty member were accompanied for the industrial visit.

On arrival, Mr. Venkatesh Human Resource received our team and he took us to the conference hall and briefed about the company profile to us. After that, our team moved to plant visit. Mr. Silambarasan supervisor was engaged with our team to guide students. He briefed about the different types of chain manufacturing assembly which includes motorcycle timing chains, bicycles, heavy road industrial chains.

Later we moved to fine blanking division, where the car seat reclamation component assembly was carried out. We had the chance to see the machine capacity of 750 Ton press. They are having various types of machines for various dimensions of chain Advantage for students we learned about various types of machining process & mechanisms of machine.

Our special thanks to Dr. N. Lakshminarashiman, Associate Professor and Dr. KL. Harikrishna, Associate Professor for their kind support in organizing this visit. As we left the campus, we left with the feeling of visiting a place that was as traditional as it was modern, a place that filled our hearts with memorable moments!!

Report on Industrial visit: Turboenergy Ltd., Paiyanoor

Second Year UG Mechanical Engineering students and ME Energy Engineering students accompanied by Dr. A.S. Ramana, Asso. Prof. visited Turbo Energy Ltd. (TEL), Paiyanoor on 23rd April 2022. TEL is a leading Turbocharger manufacturer in India. TEL has been able to achieve customer satisfaction by providing products and services of high quality at globally competitive prices. TEL also exports turbocharger assemblies and parts of Turbocharger. Turbochargers enhance performance to ensure an efficient engine system. A turbocharger has a turbine wheel in the turbine housing that absorbs the energy from the exhaust gases and mechanically transmits it to the compressor via a shaft Mr. Raghuvaran, TEL initially briefed about the company's Trust, Value & Service offered to its customers. Technical aspects and growth in demand of turbochargers were highlighted in his presentation. Visitors were divided into 3 groups and were guided by a technical head.

Assembly layout of different types of turbochargers and their intermediate processes to final despatch were shown. Use of materials such as inconel & cast iron in turbocharger turbine wheel and housing were explained. Core assembly, balancing & final assembly processes were shown & described. Visits to manual & automated assembly & quality checking of components at TEL have led to better understanding of complexity of various industrial processes. Company's employee initiatives & focus on process quality improvements through Poka-yoke and kaizen techniques were also dealt.

We are thankful to TEL, Paiyanoor for permitting us to visit the industry. It was a useful learning experience to all of us. Such visits in future will make us aware of the variety of industrial processes, market demands and trends. More details about TEL is available on https://www.turboenergy.co.in/ moments

Report on workshop for HCL Collaboration: Dr. Satheesh Kumar Gopal

A workshop was held on 11th & 12th April to discuss various areas of collaboration on projects of mutual interest, between HCL and SSN. HCL has shown interest in the following areas in Professional Service Robotics:

1. Embedded Vision and Sensor Augmentation to Robots
2. Physical Automation/ Custom Gripper
3. Custom Control Hardware and Software design
4. Robotic Software Service (Plath planning and Robot based Software Architecture)
5. Infusing Cognitive Analytics in Robotic System
6. Cloud Robotics

On the second day the morning session was entirely spent on showcasing each other's potential and probable areas of collaboration in the field of Robotics were identified:

1. Cost aspects of robots utilized by HCL
2. Intelligence aspects and
3. Patents

Then the discussion went on to 2 credit Service Robotics Course Elective for students/Part time MTech / PhD requirements from HCL. The content is already created by HCL and they only needed validation. Discussions are still on, at the management level to equate this course to internship, for the students taking this course.

I would like to thank our HOD for guiding through the process and our Principal, Vice-principal and Prof. Albal for removing the bottlenecks in the process. The discussions, though being in nascent stage, is fast evolving into an event to look forward to, considering the colossal scope it carries for the partnership and the country.

ASM STUDENTS CHAPTER INAUGURATION
Report from Faculty advisors – Dr. D. Ananthapadmanaban and Dr. Santosh

The ASM students' chapter was inaugurated on 23rd April,2022 in online mode. The function started with an invocation by students. Dr. D. Ananthapadmanaban, Faculty Advisor welcomed the delegates and spoke about the process leading up to the inauguration.

Dr. V E Annamalai, Principal, spoke about the challenges of starting and then sustaining the ASM chapter. Dr. Radha, Vice Principal, shared her experiences of starting a student's chapter and elucidated the benefits that she personally saw after the inauguration of student's chapter, IEEE. Dr. K.S. Vijay Sekar, HOD Mechanical, spoke about Industry-Institute interaction and how ASM could play a major role in networking for research benefits.

Dr Kamachi Mudali, Trustee ASM International USA and Dr. Kamaraj, Professor, IITM recalled their experiences with other chapters and urged the students to interact with other chapters. They also highlighted the various benefits like obtaining simultaneous membership into ASM, AISI, CS and MME, which are four of the most prestigious professional associations in the USA. One could also access their websites and participate in a plethora of programmes conducted throughout the year.

Mr. Srinivasan, Divisional Manager, Ashok Leyland, who was the initiator of this chapter spoke about his visits to SSN and fondly recalled his interactions with faculty and expressed confidence that this chapter will go far in the years to come. Dr. Santosh, Assistant Professor proposed the vote of thanks.

The inaugural event was followed by a technical talk on Potential of Magnesium based composites in transportation by Dr.Sushanta Kumar Panigrahi, IITM, which was well received and invigorating. The ASM chapter has been started with 30 students till date and we certainly hope that they will grow in the future. The student office bearers are:

1. Chair-Rishab Rajesh
2. Vice-Chair-Mohamed Akmal Baig
3. Treasurer-R.Vignesh
4. Secretary-R.Vaitheeswaran

International Conference Participated

D.Vijayan, D.Ananthapadmanaban, E.Ravikumar presented a paper entitled DELAMINATION STUDIES AND EFFECT OF MACHINING PARAMETERS ON DELAMINATION OF POLYCARBONATE-GFRP AND ARAMID-GFRP COMPOSITES at ICPCM 22 International Conference,March 7th and 8th,2022 at Sri Sivasubramaniya Nadar College of Engineering. They also won the best paper award for their session.

DC Meeting

Dr. K. Jayakumar, Associate Professor, attended the Second DC meeting for a PhD candidate (Mr. R. Venkatesh- Guide: Dr. A S Ramana A S, Registered in Anna University, Chennai) at Department of Mechanical Engineering, SSN College of Engineering, Chennai as DC member on 11.04.2022 through online.

Scholar Info

Dr. K. Jayakumar, Associate Professor, conducted synopsis seminar (Seminar – II) and 3rd DC meeting for his PhD scholar Mr. P. Naveen Kumar (1514299821-Part Time) on 30.03.2022 FN & AN respectively.

Mr. R. Venkatesh Research Scholar of Dr. A. S. Ramana, ASP/Mech. delivered a Research Seminar Presentation on Thermal Analysis of Friction Stir Welding of Aluminium Alloys on 8.4.2022.

Dr.A.S. Ramana, Asso. Prof./Mech. Conducted the confirmation DC meeting for his part time Research Scholar, Mr. R. Venkatesh on 11.04.2022

Mr Faris Ahmed Full Time Ph.D. Research Scholar of Dr. A S Ramana Asso Prof., Dept. of Mechanical Engg. Presented a Research Seminar on Energy Efficiency, IAQ & Thermal Comfort Studies in Airconditioned Buildings on 13.04.2022.

Dr. S. R. Koteswara Rao, Professor/Mech conducted the synopsis DC meeting for his full-time research scholar, Mr. R. Praveen on 13.04.2022.

Dr. A.S. Ramana, Asso. Prof./Mech. Conducted the Confirmation DC meeting for his Full Time Ph.D. Research Scholar, Mr. Faris Ahmed on 21.04.2022

Non-Teaching Staff Activities

Mr. Bala sundaram Palanisamy - Lab assistant / Mechanical / participated one day webinar "Smart Manufacturing: Electro-Pneumatics with Illustrated library and Janatics catalogues"on 13th April, 2022 by Famic Technologies Inc by Dr. Sunil Jihad from Indian Institute of Technology at Delhi (IITD)

Nagarajan S / Lab Instructor/ Department of Mechanical Engineering participated in the Seminar on "Research Metrics–MEASURING YOUR RESEARCH IMPACT" held on 26th March 2022 organized by the Department of Mechanical Engineering, Nadar Saraswathi College of Engineering and Technology, Theni.

Mr. Balasundaram P / Lab assistant / Mechanical / Completed Alison course of Introduction to time management on 23.04.2022 Saturday

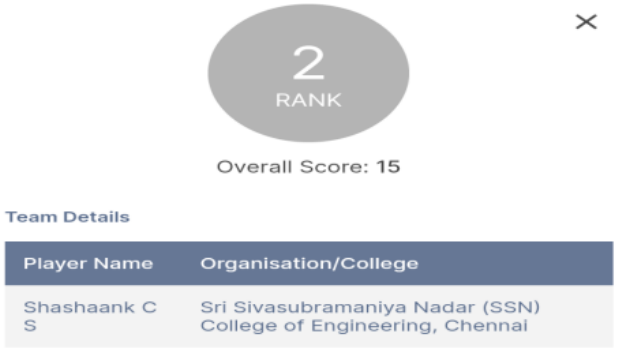
Student Write-Up

S.NO	DATE	ACTIVITY DONE DURING THE MONTH
		SECOND YEAR
1)	26/03/2022	***Shashaank.C.S*** • Nakshatra 2.0 Astronomy Competition conducted by IIT Indore
2)	07/04/2022-13/4/2022	***Mohamed Hasim*** • NSS Camp
3)	07/04/2022-13/04/2022	***Muthuvelan*** • NSS Camp
4)	07/04/2022-13/04/2022	***Nithin M*** • NSS Camp
		THIRD YEAR
5)	07/04/2022-13/04/2022 24/04/2022	***Sarvesh Karthikeyan S*** • NSS camp • Online course-NPTEL certification course (Operation management).
6)	10/03/2022-10.4.2022 14/03/2022-14/04/2022	***Hitesh Visvasenaa.P*** • Online course-Foundation of project management • Online Course-Starting a successful project
7)	20/04/2022	***Mechanical -B Students*** • Industrial Visit – TIDC Cycles

		FOURTH YEAR
8)	30/04/2022	***Muhilan S*** • Higher studies -Got admitted into Arizona State University, North Carolina State University and Texas A&M University. I am taking up the offer at Texas A&M University to pursue my Masters in Mechanical Engineering.
9)	02/04/2022-15/04/2022	***Sai Charen V*** • Online Course-Data Visualization and Communication with Tableau.

Shashaank.C.S, II-Year writes...

I'm Shashaank.C.S of Mech-B second year, I'm here to share my experience in participating in Nakshatra 2.0 Astronomy Competition.



It's an event organized by the Astronomy Club of IIT Indore. The events present in it were Problem Solving, Art and Astronomy Quiz. I won the second place in the Astronomy Quiz, for which I'll be receiving a cash prize.

The best part of the competition is the experience the participant gains, I made friends with some amazing Astronomy enthusiasts, I learned a lot of recent happenings around the cosmos which was helpful because I hadn't updated myself regarding Astronomy for a while, overall, I loved the challenges put forward by the competition. Now I know more about Astronomy than I did before. It was a great experience. Thank You.

Mohamed Hasim, II-Year writes...

The NSS unit of our college organized a 7-day camp in the Government Middle School, Thandalam from April 7 to April 13. The NSS students of our college participated enthusiastically in the camp. The students were divided into 8 batches of 7-8 students. Each batch was allotted a different activity every day such as wall painting, cooking, teaching, and cleaning the school campus.

Day 1: On the first day, all the 8 batches were asked to take a survey of the entire village. Each batch was asked to collect the information of the villagers, like their name, members of the family, profession etc., from two to three streets.

Day 2: On the second day, our batch was given the task of tree plantation. We dug the soil for planting different saplings

Day 3: On the third day, we painted the walls of the school, the entire day.

Day 4: On the fourth day, our batch taught some soft skills like basic English to the students. We had a good time teaching the enthusiastic young students.

Day 5: On the fifth day, a dental camp was conducted by our NSS unit .A few batches, including ours, helped in organizing it. After this, some competitions were held for the teachers and students of the school and the results were announced for the same.

Day 6 :On the sixth day, our batch cleaned the campus of the school.

Day 7: On the final day, we demonstrated a few basic science experiments to the students. Each batch demonstrated 2 experiments. Dr. K.S. Vijay Sekar, HOD of Mechanical Engineering department, came to witness the activities held in the camp. Following the demonstrations, a valedictory function was held to award prizes to the winners of the competitions held on Day 5. Dr.V.E. Annamalai, Principal of our college, felicitated the valedictory function as the Chief Guest. This function marked the end of the 7-day camp.

The general opinion of the camp among the volunteers was highly positive and we all had a great experience.

Shivani S, III-Year writes...

An industrial visit had been arranged for our Third year Mechanical -B section students at **TI Diamond Chain** , Ambattur, on 20th April,2022. Around 40 students with two faculty members had visited the plant on that day. Mr. Palani Samy GM , Head - Operations and his team received our students and briefed about the operations carried out at TIDC. TI's chains find wide acceptance in variety of applications in the following industrial segments:

- General Engineering
- Construction Equipment
- Agricultural Machinery
- Automotive Industry
- Printing & Packaging
- Process Industries (Cement, Mining, Power)
- Material Handling Industries.

After that, four teams had been formed (each of 10 students) and each team visited

1) Manufacturing Division
2) Assembly Section
3) Quality Department

First, we went to the machine shop, where all the raw materials needed for producing chain drive was stored. There was a wide range of equipment like harperizer, feeder, furnace wherein, the inner plate, outer plate and bush , pin were produced.

MANUFACTURING AND FINISHING

The bush is made from extrusion process from a flat plate of low carbon steel- 1080 grade . The pin is made of SEM420 grade from high carbon steel. It is cut at 90 degrees. The pin is chamfered in harperizer. Harperizing is a metal finishing process that harnesses powerful centrifugal forces to remove imperfections from metal parts. The pin is inserted into the bush hole. This is done by press fit. The roll is then manufactured which will be embedded on the bush-pin assembly. The roller is put in put in Mesh belt furnace where we have oil drive, furnace , followed by hardening , quenching, and finally tempering to get the finish.

ASSEMBLY

This was a very interesting part of the visit. It was fascinating to watch how a small component is being assembled in a large machine precisely. The inner plate is fed into the machine. On top of this, longitudinally, the bush is fit on the plate. Next, the outer plate is mounted. Through the hole of the bush, the pin is inserted , followed by a roller. For the continuation of next component, it is done using link plates , so that each component is joined together.

The component is also greased for prevention of corrosion and to give final finishing.

So, the entire component is sandwiched and is sent to the next step of sizing. The assembly is tightly pressed and sized properly, according to the customer orders.

QUALITY DEPARTMENT

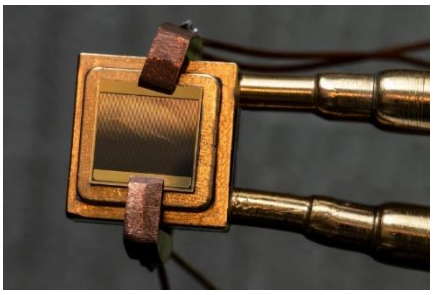
Finally, we had a chance to see the final product being tested and inspected for quality in the metrology lab. We could see it being calibrated using profile projector , screw gauge etc.

It was a very useful and interesting Industrial visit. We were thankful to **Dr. N. Lakshmi Narasimhan**, Associate Professor, **Dr. K.L.Hari Krishna**, Associate Professor and **Dr.S.A.Srinivasan**, Assistant Professor for giving us this wonderful opportunity by arranging a visit to TIDC, Ambattur to gain practical knowledge. It was the need of the hour for all of us, being mechanical students!

Mech Marvel

New Heat Engine That Could Fully Decarbonize the Power Grid

Engineers at MIT and USA's National Renewable Energy Laboratory have designed a heat engine with no moving parts. Their new demonstrations show that it converts heat to electricity with over 40 percent efficiency–a performance better than that of traditional steam turbines.



The heat engine is a thermophotovoltaic (TPV) cell, similar to a solar panel's PV cells, that passively captures high-energy photons from a white-hot heat source and converts them into electricity. The team's design can generate electricity from a heat source of between 1,900 to 2,400 degrees Celsius. The researchers plan to incorporate the TPV cell into a grid-scale thermal battery. The system would absorb excess energy from renewable sources such as the sun and store that energy in heavily insulated banks of hot graphite. When the energy is needed, such as on overcast days, TPV cells would convert the heat into electricity, and dispatch the energy to a power grid.

The team has now successfully demonstrated the main parts of the system in separate, small-scale experiments. They are working to integrate the parts to demonstrate a fully operational system. From there, they hope to scale up the system to replace fossil-fuel-driven power plants and enable a fully decarbonized power grid, supplied entirely by renewable energy. Here's an Article and a Journal Paper for further details about this development.

Corporate Story

Ninjacart

In India's immense agriculture industry, sourcing food from farmers and getting it delivered to consumers – safe, fresh, efficiently and while keeping all those involved in the business satisfied is a huge endeavour. Ninjacart is India's largest Fresh Produce Supply Chain platform, working on solving the toughest supply chain problems by using technology and analytics.

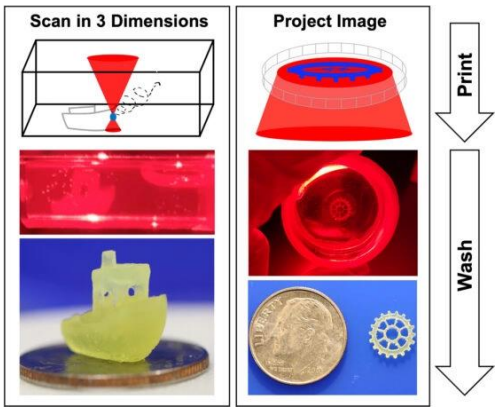
They have a presence in 7 cities, connecting producers of food directly with retailers, restaurants, and service providers using in-house applications that drive end to end operations. Ninjacart is the country's highest valued agritech start-up, with investments in millions from prestigious backers such as Walmart and Flipkart.

As per the seven-year-old start-up, it works closely with the farmers and has till date helped over 1,00,000 farmers across 150 villages to generate better revenue. It is predicted to reach unicorn valuation by the end of 2022, with the investments used to expand its solutions across India in various agriculture commodity sectors.

If you're interested, do check out their Website and LinkedIn for news and openings.

Amazing Innovation 215

Novel Method For 3D Printing!



What if 3D printing did not have to be done by building layer upon layer?

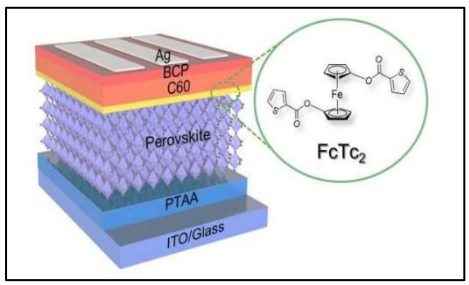
Engineers at Stanford University have developed a way to print 3D objects within a stationary volume of resin. The printed object is fully supported by the thick resin. This removes the need for the support structures typically required for creating complex designs with more standard printing methods.

In this technique, a laser is focussed through a lens and shone it into a gelatinous resin that hardens when exposed to blue light. Using just a blue laser would cause the resin would cure along the entire length of the beam. Instead, they used a red light and specialized light converting nanomaterials scattered throughout resin to create blue light at only the precise focal point of the laser. By shifting the laser around the container of resin, they were able to create detailed, support-free prints.

Researchers are working on ways to refine this process and find other applications for their nanomaterials to be put to use. Here's an Article about the research and the Journal Paper for further reading.

Amazing Innovation 216

A New Material To Make Cheaper, Efficient Solar Cells!



Traditional solar cells are made from silicon, which has good efficiency and stability, but is expensive to make and can only be manufactured in stiff panels. A collaborative effort between Imperial College London and City University of Hong Kong has resulted in the application of a new metal-containing materials called ferrocenes (compounds with iron at their centre, surrounded by sandwiching rings of carbon) into perovskite solar cells, vastly improving their efficiency and stability. Perovskite solar cells offer an intriguing alternative; they can be printed from inks, making them low cost, high efficiency, thin, lightweight, and flexible.

Tests performed by the Hong Kong team and in commercial labs show that the efficiency of perovskite devices with an added ferrocene layer can reach 25%, approaching the efficiency of traditional silicon cells. The team have patented their design and hope to license it, eventually bringing their perovskite devices to the market. Here's an Article about the research and the Journal Paper for further reading.

Alumni Write-Up

Kishore Kumar P (Mech 2017 batch)

Getting into management is a dream for many and a popular position is that of a program manager. A program consists of several projects, each providing value and progress to a long-term goal or outcome. program manager's job is to oversee not only the operations of each project, but also how the completion of each project contributes to the bigger picture. Today let us explore the career journey of our alumnus Kishore Kumar who is currently positioned as a program manager at Arizona, United States.

Kishore's venture started from his at the SAE SUPRA team as a power train head and supply chain planner. He was also active in clubs such as the EDC and was part of the core committee of instincts during his time in SSN. He secured an internship with the automotive company Simpsons & Co; he analysed the time and motion study at the heavy-duty engine assembly line layout and implemented 5S & TPM for ergonomic workstations by improving utilization and removing machine bottlenecks. Following his graduation, Kishore was admitted to the University of Florida (UF) in his industrial and systems engineering Masters. He began to focus his interests on supply chain and management domains. As a Global Supplier Quality Analyst, he worked on prescriptive data analytics. He performed required data analysis on Key performance Indexes- KPI's for supplier improvement. Following his studies in UF, Kishore landed a job in amazon as a transportation network planning specialist, securing his current role in a years' time.

Sam Kamal Balasubramanian (Mech 2016 batch)

Sam Kamal is an aspiring design engineer working at BOSCH. After graduation, Sam was recruited as a test validation engineer in Coimbatore where he gained experience in testing and validation of Denoxtronics(DNOX, an important part of the exhuast gas treatment system in commercial and off-highway vehicles) system components. He also designed solutions for field test issues. Soon he took up the role of product design engineer and later, a senior design engineer.

After a developing a strong foundation in engineering design, Sam went on to pursue his Masters in the engineering management in the prestigious North-eastern University in Boston, Massachusetts, USA. Currently he is working as a Senior Design Engineer & Onsite Co-Ordinator in Bosch Farmington Hills, Michigan.

Research news & Forthcoming events

Project Proposal Submission

Source: SERB Call for Proposals 2022.pdf

Programs/ Schemes		Call opening date	Call closing date
1.	Start-up Research Grant (SERB-SRG)	01-02-2022 (Tuesday)	01-03-2022 (Tuesday)
2.	Core Research Grant (SERB-CRG)	01-02-2022 (Tuesday)	18-04-2022 (Monday)
3.	Teachers Associateship for Research Excellence (SERB-TARE)	10-02-2022 (Thursday)	15-03-2022 (Tuesday)
4.	SERB-MATRICS	23-02-2022 (Wednesday)	22-03-2022 (Tuesday)
5.	Scientific and Useful Profound Research Advancement (SERB-SUPRA)	11-04-2022 (Monday)	10-05-2022 (Tuesday)
6.	Accelerate Vigyan – ABHYAAS (For Winter Events)	02-05-2022 (Monday)	31-05-2022 (Tuesday)
7.	National Postdoctoral Fellowship (SERB-NPDF)	02-05-2022 (Monday)	01-06-2022 (Wednesday)
8.	Empowerment and Equity Opportunities for Excellence in Science (SERB-EMEQ)	01-06-2022 (Wednesday)	30-06-2022 (Thursday)
9.	Science and Technology Award for Research (SERB-STAR)	15-06-2022 (Wednesday)	28-07-2022 (Thursday)
10.	Technology Translation Award (SERB-TETRA)	04-07-2022 (Monday)	03-08-2022 (Wednesday)
11.	SERB International Research Experience (SERB-SIRE)	01.08.2022 (Monday)	30.08.2022 (Tuesday)
12.	Promoting Opportunities for Women in Exploratory Research (SERB-POWER)	01-09-2022 (Thursday)	30-09-2022 (Friday)
13.	National Science Chair	01-09-2022 (Thursday)	31-10-2022 (Monday)

SERB Fund for Industrial Research Engagement (SERB- FIRE)

Last date for submission of the project proposal: **03-05-2022**

The Electronic Project Proposal Management System, For SERB (serbonline.in)

Department of Biotechnology

Joint Projects under UK-INDIA COVID-19 Partnership Initiative

Last date for submission of the project proposal: **05-05-2022**

http://dbtindia.gov.in/latest-announcement/announcement-joint-projects-under-uk-india-covid-19-partnership-initiative

Scientific and Useful Profound Research Advancement (SUPRA)

Last date for submission of the project proposal: **10-05-2022**

The Electronic Project Proposal Management System, For SERB (serbonline.in)

Intensification of Research in High Priority Areas (IRHPA)

National Biosafety Level (BSL 3 / ABSL 3) Facilities

Last date for submission of the project proposal: **02-06-2022**

The Electronic Project Proposal Management System, For SERB (serbonline.in)

Last date to apply: 22nd May 2022

The Tactical Mindset

The Scout mindset

Imagine you are participating in an upcoming hackathon with your friends. First thing you do after identifying the problem statement is to have a brainstorming session. After this stage, have you noticed that you seem to be more involved with the project and you work harder when "your idea" has been approved; in contrast, when your ideas have been shot down, you don't seem fundamentally motivated? Or when your favourite cricket team is playing and the umpire decides against your team, you are riled up and call out the umpire's supposed bias, as opposed to when the decision is against the opponent team you see merit in the umpire's verdict and refuse to look beyond. Have you ever witnessed this?

This is a case of what scientists refer to as "**motivated reasoning**," a phenomenon in which our unconscious motivations, desires and fears shape the way we interpret information. Some pieces of information feel like our allies – we want them to win; we want to defend them. And other pieces of information are the enemy, and we want to shoot them down. This is also called as a solider mindset, which works well in a battlefield but in real life certainly not. It makes us believe we are right even when we are wrong.

Our judgment is strongly influenced, unconsciously, by which side we want to win. This shapes how we think about our health, our relationships, and what we consider fair or ethical. To be objective and to see things clearly the way they are, one need to adapt scout mindset.

Scout mindset means seeing what's there as accurately as you can, even if it's not pleasant. Scouts are curious. They feel pleasure when they learn new information or solve a puzzle. They test their own beliefs, and they don't feel that someone who changes their mind is weak. And, above all, scouts are grounded, their self-worth as a person isn't tied to how right or wrong, they are about any particular topic.

We need to change the way we feel – to learn how to feel proud instead of ashamed when we notice we might have been wrong about something, or to learn how to feel intrigued instead of defensive when we encounter some information that contradicts our beliefs. So, the question you need to consider is: What do you most yearn for – to defend your own beliefs or to see the world as clearly as you possibly can?

Corporate Wisdom

From the desk of Ramki -– Aspire to Inspire

Happy Morning

It happens to all of us many times. The dilemma of choice and I wonder if you agree with me on this.

As we park our cars or vehicle in the parking lot or basement to take us to our office on one of top floors- we are confronted by choice. There are two elevators that we could possibly choose from. One is a 'slow' option and it stops on every floor. And the other is the 'Express' option. It stops only at the even number floors- and of course at the basement. Which elevator should we take? The express one? or whichever comes first? And as We wait with other folks for an elevator- it is fascinating to watch the dilemma play out every morning.

I don't know if our mind is playing tricks on me, but it feels like the "slow" elevator almost always presents itself first. We get into it rather reluctantly, longingly eyeing the panel of the elusive "Express" elevator. And as the slow elevator gently lifts off, only to stop quickly on the first floor, we can hear a collective sigh of disappointment. People turn their wrists to look at that watch – "Argh- late again". Further glances at each other indicate a shared sum of dismay. If elevators had a mood indicator, this one would clearly show "irritated".

Think for a while – Our experience with elevators is probably true to our lives too. We see two paths ahead of us- and we are never sure which one to choose. And we make a choice- and then worry about the road not taken.And often our choice is dictated not by what we know is the better option- but by what presents itself first. As the saying goes "A bird in the hand- seems like several in the bush We are not willing to wait. So we take the elevator that comes first. Or the first job we get offered. Waiting seems such a waste of time.

So what is the way out? Should we just decide what is best- the express elevator for instance- and then not get tempted when life's slow elevator comes up first? Easier said than done?

Maybe we should all just learn to relax a bit and not get too stressed by every choice we need to make. Both the elevators eventually get to the floor you want to go- to our destination- and maybe which is what should really matter. Non one's going to look at us and say "Ha, Ha, he took the slow elevator! and by not getting too caught up in the choice of the elevator, we might learn to enjoy the ride, just a bit more. And maybe, that might help wipe out the frown on our face and replace it with a smile. Now what is that worth?

And in our life – as the elevator- it might help us to let go of our fascination with this misplaced sense of urgency. Getting there faster- nay, first – doesn't need to become an over-riding tenet of our lives. Think about it. Wherever you go, you see people agitated about getting ahead. Look at the queues in the supermarket, and you will see this young couple splitting and waiting in two separate queues- just in case Murphy is right again. Why give up the pleasure of each other's company for five minutes- just to possibly check out 30 seconds faster? It happens early morning in the airport- as busy executives jostle like school kids-just to get past security first. Worth the stress?

#WishingMostAndMore

Have a great week & Wonderful day!

R. Ramakrishnan

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