Aspire

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Monthly Newsletter

Department of Mechanical Engineering

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Sri Sivasubramaniya Nadar College of Engineering

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

Frederick Soddy—Pioneer in Radioactivity

Frederick Soddy was an English chemist who, with Ernest Rutherford, explained that radioactivity is due to the transmutation of elements, now known to involve nuclear reactions. He also proved the existence of isotopes of certain radioactive elements. He was a polymath who mastered chemistry, statistical mechanics, finance, and economics.

Frederick Soddy, the son of Benjamin Soddy, a London merchant, was born in Eastbourne, Sussex, England, on September 2, 1877. He was educated at Eastbourne College and the University College of Wales, Aberystwyth.



Leaving Canada, Soddy then worked with Sir William Ramsay at University College, London, where he continued the study of radium emanation. Here, Soddy and Ramsay were able to show, by spectroscopic means, that the element helium was produced in the radioactive decay of a sample of radium bromide and that helium was evolved in the decay of emanation.

From 1904 to 1914, Soddy was a lecturer in physical chemistry and radioactivity at the University of Glasgow. Here he did a lot of practical chemical work on radioactive materials. During this period, he evolved the so-called "Displacement Law," namely that the emission of an alpha-particle from an element causes that element to move back two places in the Periodic Table. His peak was reached in 1913 with his formulation of the concept of isotopes, which stated that certain elements exist in two or more forms having different atomic weights but are chemically indistinguishable.

In 1914, he was appointed Professor of Chemistry at the University of Aberdeen, but his plans for research were hampered by the war. In 1919, he became Dr. Lees Professor of Chemistry at the Oxford University, a post he held until his retirement in 1937.

After his period at Glasgow, he did no further work in radioactivity. His interest changed to economic, social, and political theories, which gained no general acceptance at the time, and to unusual mathematical and mechanical problems.

His books include Radioactivity (1904), The Interpretation of Radium (1909), The Chemistry of the Radioactive Elements (1912-1914), Matter and Energy (1912), Science and Life (1920), The Interpretation of the Atom (1932), The Story of Atomic Energy (1949), and Atomic Transmutation (1953).

Soddy was elected a Fellow of the Royal Society in 1910, and Oxford awarded him an honorary degree. He received the Nobel Prize in Chemistry in 1921, and in the same year, he was elected member of the International Atomic Weights Committee. A small crater on the far side of the Moon and a radioactive uranium mineral, soddyite, are named after him.

Source: https://www.nobelprize.org/prizes/chemistry/1921/soddy/biographical/

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Campus Update





То

Work_®

Certified

Jan 2021 - Dec 2021 INDIA We are delighted to share that **Shiv Nadar School** has been certified as a **Great Place to Work™** for the second year in a row.

Having been certified for **Building and Sustaining a High-Trust**, **High-Performance Culture**TM, this is truly a proud moment for us, which has been rendered possible thanks to your continued trust, good wishes and support on every step of our journey.

Our enhanced scores across all parameters this year is heartening, especially the increase in the aspects of **Pride and Camaraderie**.

The former is a testament to our culture of care and drive for excellence, and the latter, to the strength of relationships within our community despite the absence of physical meetings for the entirety of the year. It is a matter of immense joy for us that **our scores** on these two parameters **far surpass the average scores** of India's Top 100 Great Places to Work (2020 rankings).

(The Great Place to Work® model is the world's most researched, accepted and sustainable definition of a great workplace from an employee's point of view. It is a comprehensive framework encompassing the overall employee experience ecosystem.)

3 Campuses Noida | Gurgaon | Faridabad 4900+ Students CBSE, IB & IGCSE Affiliated

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Department Update

Placement Update



A student Gowri Sankar K, final year, M.E Manufacturing Engineering got an internship at ESAB during last semester (III Sem). The call for Internship by the company was initially shared by HoD/EEE and Mech. In response,

Gowri Sankar applied and got the internship offer. Now after successful completion of his internship, he had been given an offer. As the fourth semester is in progress for the candidate, he is considered as Project Intern. Post his completion of the course, he will become a full-fledged regular employee of ESAB as a Trainee for the next 12 months.

Lateral Entry student Glaston Sekar D. in Ernst and Young for the role of Analyst - Data Management & Visualization. CTC is 3 Lpa. (will get duly revised after his stay at the company for a while).



Placement counts at 53.



Final Mech student, Sathyajhith got placed in Royal Enfield after a splendid performance. CTC is 3.7 LPA. He had already got offers from CTS/TCS. Mech

Dr. N. Lakshmi Narasimhan

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4 New Faculty Joined as Assistant professor (on-contract)



Mr. Raja S obtained his undergraduate degree in Mechanical Engineering with distinction from Sri Sivasubramaniya Nadar College of Engineering. He received his master's degree specialized in Internal Combustion Engineering with Gold Medal from Anna University Chennai. He has submitted his PhD Thesis in Anna University, Chennai.



Mr. Divya Zindani obtained his undergraduate degree in Mechanical Engineering from Rajasthan Technical University. He received his master's degree specialized in Design from the Birla Institute of Technology, Mesra. He has submitted his PhD Thesis in NIT Silchar.



Mr. Aman Kumar obtained his undergraduate degree in Mechanical Engineering from IIEST Shibpur. He received his master's degree specialized in Mechanical Systems Design from IIT, Kharagpur. He has submitted his PhD Thesis in Nonlinear Dynamics from IIT Kharagpur.



Dr. S A Srinivasan obtained his undergraduate degree in Mechanical Engineering from Sona College of Technology. He received his master's degree specialized in Thermal Engineering With distinction from the Government College of Engineering Salem. He has obtained his Ph.D Degree from NIT Trichy.

Resource Person for AICTE sponsored FDP



Dr. M S Alphin, delivered a guest lecture in FEA for Biomechanics in AICTE -Sponsored STTP program on "Fundamentals of Finite Element Analysis and its Applications in Engineering", organized by the Department of Mechanical Engineering, Panimalar Institute of Technology, Chennai on 17 Feb 2021

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Publication in Fuel, Elsevier with 5.578 Impact Factor



Nivin Chacko, Sundararajan Rajkumar, Jeyaseelan Thangaraja, Experimental and Modeling Analysis of Multiple-Injection Strategies with B20 Operation in a CRDI Engine. Fuel, 2021; 293:120433.

https://authors.elsevier.com/a/1cemM3iH4EPHM

Though, multiple-injection is effective in simultaneous reduction of NOx and smoke emissions, the injection schedule comprised by the multiple-injection strategy plays a vital role in achieving better fuel efficiency and reduced emission. This necessitates exhaustive experimental investigations to analyze the effect of injection parameters of the multiple-injection strategy. However, this tedious task can be eased by a validated model by carrying out the parametric investigations which can avoid time-consuming experiments. Therefore, the present study features the application of multi-zone phenomenological modeling on biodiesel fueled multiple-injection diesel engine and extension of the validated model for parametric analysis. The effects of pilot fuel quantity, dwell between pilot and main injection, post fuel quantity and dwell between main and post-injection on performance, combustion and emission characteristics are analyzed in the detailed parametric investigations for arriving the trade-off between performance and emission. The parametric investigations recommend a suitable pilot fuel quantity and longer dwell between the pilot and main injection for NO reduction, and a small quantity of post fuel and medium dwell between main and post-injection for achieving soot reduction without penalty on mean effective pressure.



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Publication in Wear with 4.1 Impact Factor



K. Vishal, K. Rajkumar, V.E. Annamalai, Wear and tribofilm characterization of bamboo CNT (b-CNT)-peek composite with incremental blending of submicron synthetic diamond particles, Wear, 466-467 (2021)

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Wear characteristics modified on high functionality tribo poly-ether-ether-ketone (PEEK) composite fabricated through the spatial distribution of bamboo Carbon NanoTube (B-CNT) with incrementally blended networks of sub-micron high thermal conductivity synthetic diamond (SD) particles were studied. The composites were developed by the hot press sintering route and were characterized for their mechanical, thermal stability, chemical state, and tribological properties. On the addition of reinforcement

particles, the hardness of the composite was increased by 25%, and thermal stability improved by about 25 °C due to the strengthening effect of diamond particles. FTIR reveals the existence of the chemical compatibility of reinforcements in the matrix. XRD results reveal that the addition of reinforcements in the matrix does not alter the structure of PEEK.

Wear characteristics of PEEK composite were investigated by varying applied pressures. The coefficient of friction reduced to 30% for 0.5%SD & 0.75%B-CNT sample, and the specific wear rate was reduced to 39% for 1%SD & 1%B-CNT sample compared to neat PEEK, at maximum loading condition. The coefficient of friction and specific wear rate were reduced to a larger extent due to transfer film consisting of ferric oxide film confirmed by XPS oxygen region peak 531.85 eV and distorted polymer rings was confirmed by Raman spectroscopy.



External Funded Project Applied

Project Title: Development of Social Interface for NAO Humanoid Robot to make a Nurse-like Assistant for an Elderly Care Service; PI: Dr. K. S. Jayakumar; CO-PI: Dr. V. Vaithianathan/ASP/ECE, Total Budget (INR): 30,73,400, Funding Agency: CRG-SERB, Date of Submission: 26/02/2021



Patent Applied

Aditya Bucha and Dr. Satheesh Kumar Gopal submitted the CSB for the "Mosquito Eradication Robot", 202041007302 on 20.02.2021

Invited Lecture



Mr. S. Raja, AP/Mech delivered a speech as a speaker on "Training on Mendeley software" in a Transdisciplinary workshop organized by PG Departments of Basic Sciences, SDNB Vaishnav College for women on 04.02.2021.

Invited Lecture for AICTE sponsored FDP



Dr. M Selvaraj, delivered a guest lecture for AICTE - Sponsored STTP program on "Fundamentals of Finite Element Analysis and its Applications in Engineering", organized by the Department of Mechanical Engineering, Panimalar Institute of Technology, Chennai on 19 Feb 2021





K. Ramraji, full time research scholar has successfully completed Ph. D. Viva-voce titled "A comprehensive study of natural particulate and fiber stacking on mechanical, thermal and dynamic behavior of flax fiber interleaved vinyl ester composites" on 10th February 2021. Research Supervisor: Dr. K. Rajkumar

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Faculty Writeup



Dr. K. Jayakumar, Associate Professor, delivered an Expert talk in AICTE -Sponsored STTP program on "Design of Experiments in Engineering", organized by the Department of Mechanical Engineering, Padma Shri Dr. B. V. Raju Institute of Technology, Narsapur, Telangana State.

NAGARAJAN S, Lab Instructor on the courses completed

Completed Alison – Courses

- 1. Advanced Diploma in Fundamentals of Manufacturing Processes
- 2. Introduction Manufacturing Processes
- 3. Fundamentals of Antifriction Bearing

Conference, Workshop & Webinars Attended



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- Attended the two-day National e-Conference "Online Teaching and Learning" by Govt. P. G. College, Bilaspur Rampur, Uttar Pradesh on 23 - 24/01/2021.
- 2. Attended the National Webinar **"Urban Earthquake Risk Mitigation"** by National Institute of Disaster Management, Ministry of Home Affairs, Government of India, New Delhi on 25/01/2021.
- Attended the International Webinar" Automated Fibre Placement Technologies for Aerospace Applications" by Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, UK, on 28/01/2021.
- Attended the one-day online Workshop "Ultrasonic Assisted Casting Approach for Manufacturing Aluminum Nanocomposites" by Department of Mechanical Engineering, SSN College of Engineering, Kalavakkam, on 05/02/2021.
- Attended the International Webinar" Steam Quality" by Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London, UK, on 10/02/2021.
- 6. Attended the one-day online Workshop **"Fabrication of Polymer Matrix Composites"** by Department of Mechanical Engineering, SSN College of Engineering, Kalavakkam, on 13/02/2021.
- Attended the two day "International Conference on Advances in Materials and Manufacturing (ICAMM 2021)" by Department of Mechanical Engineering, SSN College of Engineering, Kalavakkam, from 18/02/2021 to 19/02/2021.

Computer Course Participated

Got 12 Nos. of Computer and English course certificates from Study Section online Test, during the month of February 2021.

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VALUE ADDED COURSE BY PROF. MANOJ GUPTA, NUS, SINGAPORE.

Dr. K.S. Vijay Sekar, Associate Professor writes on successfully Coordinating the Value-added course delivered by Prof Manoj Gupta, National University of Singapore.....

I had the privilege of coordinating the first value added course for the Mechanical UG students delivered by Prof Manoj Gupta, NUS Singapore. Prof Gupta accepted my invite instantly and was happy to be associated

with our department and institution. He earlier had graced our ICEMMM2018 conference in Feb 2018 as one of the keynote speakers and shared his rich research experience in the field of bio compatible and ecofriendly magnesium alloys used for cutting edge applications in the areas of biomedical and structural designs. He is also one of our keynote speakers for ICEMMM2021 to be conducted in Dec 2021.



The course titled " Metal matrix composites - An Introduction to MMC's and ways to manufacture them" designed particularly for the UG students spread over 15 hours was conducted online between 3.30 to 4.30 pm IST. 54 students enrolled for the course from III-year Mechanical students and cherished the opportunity of learning from an eminent academic and researcher who has more than 18000 citations, h index of 70+ and figures in the Top 0.6% of leading Scientists as per Stanford University list.

The course itself was a walk through on the basics of metal matrix composites slowly gaining momentum to traverse higher levels of pedagogy with descriptions on metallographic and micro structural characterization of various classes of MMC's and in-depth analysis of their applications and methods of manufacture. An assessment test has been scheduled for 28th February 2021 for a question paper set by Prof Gupta which will be graded and shared to the students. It was an enriching experience tuning in to his lectures and students expressed their gratitude towards the Prof for empowering them with research knowledge that will help them in their career choices.

Vimal Kumar Bharathi shared his candid feedback on how he hardly knew anything on MMC and how this course has made him interested in material science field going forward. Mohd. Tanvir who was the student representative for the course expressed his happiness and wished to work with Prof Gupta in the future, which was welcomed by him and he expressed how he is already collaborating with many researchers worldwide. Surya prakash opined that the course provoked a new thought process in him and made him get interested in material science. Overall it was a rewarding experience for our students and a personally fulfilling one for me as its coordinator.

I take this opportunity to thank madam Dr. Kala Vijayakumar, President SSN Institutions for having approved this marquee course which will be a big value addition to the Institution, our Principal Dr. VE Annamalai for his consent and encouragement and our HOD Dr. N. Nallusamy for his constant support and guidance.

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On behalf of SSN Institutions, I thank Prof. Manoj Gupta for spending his valuable time with us and motivating our students to take up cutting edge research in materials.

Other Monthly Activities

Dr. Satheesh Kumar Gopal conducted two days workshop on 'Advanced Robotics' at on 19th & 20th February, 2021 at Sri Sai Institute of Technology and Science, Rayachoty, Andhra Pradesh

Dr.L.Poovazhagan, Dr.K.Rajkumar and Dr.B.Anand Ronald ASP/Mechanical have successfully conducted the one day online workshop on "Ultrasonic assisted casting approach for manufacturing Aluminum nanocomposites" on 05.02.2021.

Dr. B. Anand Ronald, Dr. K. Rajkumar and Dr. L. Poovazhagan, conducted the One day Online Workshop on "Fabrication of Polymer Matrix Composites" on 13 February 2021.

Vimal Samsingh, Achyuth Ramachandran, Anirudh Selvam and Karthick Subramanian, Python implementation of fuzzy logic for artificial intelligence modelling and analysis of important parameters in drilling of hybrid fiber composite, IOP Conf. Series: Materials Science and Engineering, 1012 (012037) & 1-12, 2021.

D.Ananthapadmanaban and Vetriselvan.V presented a paper entitled Comparison of Tensile strength and ductility of steel and GRE using finite element method, SSNCE, 19th February, 2021

Dr. S A Srinivasan Invited to serve as External examiner for students in-house R&D projects of dept of mechanical engineering, Sona College of Technology, Salem, Tamil Nadu.

Dr.R.Vimal Samsingh, ASP/Mech conducted the first DC Meeting for his part –time Research Scholar, Mr. Louies Praveen. S on 17.02.2021

Dr. Ananthapadmanaband, attended 2 day webinar on Additive Manufacturing, Rama University, Kanpur on 17th and 18th February, 2021

Mr. Ponmuthuraja J Completed Protecting the World: Introducing Corrosion Science and Engineering in Coursera

Mr. Ponmuthuraja J "Attended the One Day Online Workshop on "Ultrasonic assisted casting

approach for manufacturing Aluminum nano composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 05/02/2021.

Mr. Ponmuthuraja J, Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix Composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 13/02/2021.

Mr. Nandakumar P, Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix Composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 13/02/2021.

Mr. Nandakumar P Attended the One Day ONLINE Workshop on "Ultrasonic assisted casting approach for manufacturing Aluminum nano composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 05/02/2021."

Mr. Subramani R "Attended the One Day Online Workshop on "Ultrasonic assisted casting approach for manufacturing Aluminum nano composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 05/02/2021"

Mr. Subramani R , Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix Composites" by the department of mechanical Engineering, Sri Sivasubramaniya Nadar college of Engineering, Kalavakkam, on 13/02/2021.

Mr. Subramani R Completed Alison – Course :Diesel Engine Basics on 23/02/2021

Mr. Krishnasamy M , Alison Certification for Mechanical Engineering - Internal Combustion Engine Basics on 23.02.2021"

Mr. Krishnasamy M, Attended the One Day Online Workshop on "Ultrasonic assisted casting approach for manufacturing Aluminum nanocomposites" on 05.02.2021"

Mr. Krishnasamy M, Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix Composites" on 13.02.2021"

Mr. B Bharathi Alison Certification - Mechanical Engineering - Internal Combustion Engine Basics on 22.02.2021

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Mr. B Bharathi , Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix

Composites" on 13 February 2021"

Mr. B Bharathi approach for manufacturing Aluminum nanocomposites" on 05.02.2021"

Mr. Arumugam K Attended the One Day ONLINE Workshop on "Fabrication of Polymer Matrix Composites" on 13 February 2021"

Mr. Arumugam K, Attended the One Day Online Workshop on "Ultrasonic assisted casting approach for manufacturing Aluminum nanocomposites" on 05.02.2021"

Dr. M. Nalla Mohamed attended two days audit training program for faculty members conducted by the TUV - NORD Training Academy on 24.02.21 to 25.02.21

Dr A S Ramana, Asso. Prof., attended the Webinar Training Program on "ISO 9001:2015 Internal Auditor Training Program on 24th -25th February 2021 Organized by TUV NORD Training Academy

Dr. A. S. Ramana, Asso. Prof., Dept. of Mechanical Engg. was invited to be a Doctoral Committee Member for PhD Research scholar, Mr. S. Thiagarajan, Asst. Professor, Easwari Engg. College, Chennai. under the supervision of Dr. Antony Aroul Raj, Prof., Easwari Engg. College, Chennai.

- 1. Alison online course: Diploma in Workplace safety and Health "
- 2. Alison online course: Basics of Diesel Engine"
- 1. Udemy online course: Best Practices for Working Remotely

Dr. K.S. Vijay Sekar, Asso. Professor/Mech, successfully coordinated a two week one credit value added course titled " Metal Matrix composites - An introduction to MMCs and Ways to manufacture Them " delivered by Prof Manoj Gupta, National University of Singapore between Jan 25th and Feb 16th 2021 for the benefit of III year Mechanical students.

Dr.K.S.Vijay Sekar, Asso.Prof / Mech as SSN Coordinator along with Dr.V.Rajini, Prof/EEE as the SSN Nodal officer, successfully collated and submitted the institutional data for the NIRF 2021 Rankings on 17th Feb 2021.

Student Write-up

VIRTUAL RECRUITMENT

I am Sathyajhith S S, and I would like to share my experience on Royal Enfield's placement process.

Round 1: AMCAT

The AMCAT test was a computer-based online test in order to test our logical and irrational thinking. It consisted of several sections viz. english, maths, data interpretation, reasoning, etc.

All these sections will have a specific time limit, so be ready to answer the questions correctly and quickly. Skip the question if it takes time. Try attending a maximum number of questions. Most of the questions are simple and straightforward.

Round 2: Psychometric test

Psychometric tests clearly identify your personality. Consider the fact that this is an elimination round, have a calm mind, and take the test. Since the time given for the questions is very little, don't manipulate your answers. Just be truthful and don't contradict your answers. Wear a smile on your face and take the test with a calm mind. The more you smile, the better the chances for you to clear the round.

Round 3: Group Discussion



GDs test your perspective, thinking ability, and level of communication. This was not an elimination round, but don't take it for granted. This round's performance clearly reflects in your final interview. So, give equal importance and prepare well. We were asked to tell the topic of our project spontaneously and explain it within a minute. He

jotted down the points to counterattack us in the interview. Be clever while you explain your project because the questions will be asked related to that. There was also a discussion about engineering and technology. It is better to be updated.

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Round 4: Final interview

Interviews check whether our skills and character align with the firm's needs and culture. So before attending the interview, know about the company, its weaknesses, and your strengths. Try convincing them that, your strength will be very helpful for solving the company's problem.

Be ready for answering questions that may come from your resume or the technical part of your learning. Since I have done a lot of projects in my undergraduate, I was asked to explain about all my projects and at the end of each project, questions were asked accordingly. Throughout the interview process don't be too nervous or too excited, just stay normal. Finally, the way of presenting things really matters. Check whether your thoughts are properly communicated to the receiver. You can master this by giving a sample interview with your friend and mirror talk helps increase your boldness. A final tip is to use some gestures to make the listeners more involved. Also, self-introspect yourselves, so that you may find the good qualities which they may expect. And while saying that you are an irrational thinker, prove it with an example from your life, so that it will get strongly registered.

Vignesh B, IV-year, writes...

WALKTHROUGH OF APPLYING TO A POST-GRADUATE PROGRAM (Confined to only America):

HOW TO APPLY FOR A MASTERS DEGREE

Hello, this is Vignesh, a senior-year mechanical engineering student at SSN. Here's a walkthrough of applying to a post-graduate program in America with some hindsight. This is entirely based on my experience, and thus if you come across any conflicting information whilst applying, feel free to trust them.

The application process for the fall semester usually opens in August and closes around January. Few anomalous universities hold strict deadlines; however, the information is easy to look up.



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Early on in applying, I knew I had to figure out a handful of schools I was going to apply for. The application process as a whole is expensive. On average, it costs around \$100-150 per application, which includes application fee, GRE and TOEFL submission, and acquiring transcripts. Around may 2020, I made a list of 10 universities that interested me. The major factor I took into account were the faculty profiles and how much their interests and research aligned closely with mine. Besides using google scholar for looking up their papers, the interlibrary loan system of SSN helped me get some of the articles that weren't publicly available. The second iteration of sifting involved partitioning the schools based on the likeliness of getting accepted. Here, I used previous databases of accepted profiles of each university to narrow down to 8 final universities and ranked them from ambitious to safe.

Usually, graduate programs look at five parts in applications.

- 1. Personal statement/Statement of Purpose (SOP) and/or Resume/CV
- 2. Research Experience
- 3. GRE/TOEFL
- 4. Undergrad GPA
- 5. Letters of Recommendation (LOR)

Personal statement:

A personal statement is a concise, yet not too short essay that expresses what you are interested in, why you are interested in it, how it relates to your undergrad experience, and how your undergrad education and research makes you a good fit for the graduate program. Knowing that an SOP is one of the most cardinal and swaying chunks of an application, I devoted the most time to it. To begin with, I worked on a generic essay which was based on the program requirements. Later, I found professors I potentially wanted to work with, mentioned them in my statement and tailored my research and interests to theirs. This says you looked into the program other than just their reputation. Of course, don't just name drop. Explain how working with this professor meets your goals and how you two will be a good fit. Unlike an undergrad essay, a graduate essay is all business. Stay away from personal aspects or extracurricular activities unless they are groundbreaking. Few don'ts that are an instant repel are, getting too personal, refraining from writing college specific essays, involving cliches, not addressing low grades or low GRE, and transgressing the word limits. Look up the web, various online sources are available for more insight. Luckily, I had a classmate to work with and to help me expedite the process. After a considerable progress, we ran the essay by each other to vet it and made sure we followed all the protocols to put together a cogent essay. Huge props to Shashank.

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Research Experience:

Research experience is quite self-explanatory. Since you're applying for an advance degree in STEM, it is always advisable to have some research experience. The best way to do this is to poke around on professor and department websites and search for their research blurbs. Read through those until you get a feel for the types of work that interests you. Summer fellowships, research projects, or undergraduate research assistantships all come a long way in making your application stand out. If you are having difficulties getting into a lab at school, look for an internship that typically takes students with little research experience and use that as your springboard into the field. And yes, an internship is just as good as a research experience. To top it all off, you also have someone lined up to write a letter of recommendation. So, if you are a rising senior, get on it asap.

GRE/TOEFL:

General tests have their place in this process. However, they are just to assess your literacy. They vary from university to university but one good rule of thumb is to score a high percentile in the quants section of GRE. Being a lateral entry student, I had to brush up on some high school math to get me on track with the fundamentals. After acquainting myself to the basics, I took another couple of months to get myself familiar with the test. Exposing yourself to as many mock tests you possibly can will help you assimilate with the time bound environment. Although the verbal section isn't as important as its counterpart, it's advisable to maintain a good percentile. However, don't sweat on it much. TOEFL being a screening test, it's the facet with the least precedency. After few months of preparation, I managed to pull off a 320 and 113 in GRE and TOEFL respectively.

GPA:

This goes for getting a job post graduate school as well, but GPA tends to be a reasonably large factor in the admissions process. The most important classes will be those related to your field of study, but you will also want to have the highest overall GPA you can manage. I managed to maintain an 8.4 and I also took up few MOOC's and online courses to offset some of the B's. So that's a handy tip if you're on the same boat as mine.

Letters of Recommendation:

They are letters from professionals that vouch for your abilities. Most graduate programs will require three letters of recommendation. Make sure you choose your writers carefully and prepare them well to write the best possible letters for you. Ask the professors who know you best. The best choices are those you have done research with and/or who have read your academic writing. I reached out to three professors from our department, with one being my undergrad advisor and the other two being my

project guides. Since I had the opportunity to develop a good relationship with them, the letters were far from being lukewarm.

There's a difference on being an acceptable applicant versus being a competitive applicant. A compelling application will excel in at least four out of the five areas. Thus, the number one tip would be to start early. Junior year would be right time to think about what grad school programs you might be interested in, what you want to study, and what you need to prepare for your applications. Nailing the above criteria will surely set yourself up well for your future applications.

NOTE: My acceptances: Ohio State University, University of Minnesota, Arizona State University, University of Florida, University of Colorado, University of Maryland.

Saravanan T, III-year, writes...

I applied for an internship through Internshala at Machenn Innovations, a deep tech start-up based in Coimbatore which concentrates mainly on Additive Manufacturing, Virtual Reality and Augmented Reality. Through a telephonic interview after a couple of days, I was sent the offer letter stating that I was selected as an 'Engineering Intern'. The internship consists of 15 days of training in the domain of AM and 3 months online work based on the training offered. The online work comprises of proposing a paper, developing conceptual designs and



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also some digital marketing and administration tasks for the sake of expanding their company's reach. Necessary stipends would be provided on the completion of various tasks. I am halfway through the training period and various steps in AM have been covered until now. Also, they are offering various workshops and have partnered with Ultimaker, the leading 3D printer manufacturer and provide courses for students certified by Ultimaker and University of Illinois at a reasonable price. I am very much excited to face the challenges and be benefitted by this internship.





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Mech Marvel

Organs soon to become DIY?

If you were planning to perform open-heart surgery on someone, it would definitely help if you could first do a "dry run" on an exact replica of their heart. Doing so may soon be possible, thanks to a recent advance in 3D printing technology.

First of all, it is already possible to produce a physical replica of a person's heart, based on MRI scans. Such models are typically made of rubber or hard plastic, however, so they lack the texture of the real thing. Doctors can examine them from different angles, but they can't practise the actual surgery on them. That's where the Freeform Reversible Embedding of Suspended Hydrogels (FRESH) technique comes in.

Developed in the lab of Carnegie Mellon University's Prof. Adam Feinberg, it utilizes a "bio-ink" made up of a natural polymer known as alginate. That bio-ink is extruded from a moving needle into a hydrogel bath, which holds the soft polymer in place as the object is



printed. Once the printing process is complete, the hydrogel is melted away via the application of heat, leaving only the object behind.

Although the technology has previously been used to create miniature models of organs, this is the first time it's been utilized to print a full-size replica. Among other things, the process required building a new 3D printer that could accommodate a larger hydrogel bath, and tweaking the printing software.

The finished 3D-printed item is claimed to mimic the elasticity of a real human heart, and can be cut and sutured in a similar manner.

Read more about the team's work in their article published in the journal ACS Biomaterials Science and Engineering. This YouTube video features the team talking about the work.

Corporate Story

Baud Resources

Baud

Baud Resources is an innovation-oriented research venture raising a multi patented technology known as windTRAIN[™] to enhance Wind Energy Economy.

The team at Baud Resources is developing an advance hardware and control engineering system known as windTRAIN[™] technology that improves the performance of wind turbines by a

significant factor. Baud's multi-patented windTRAIN[™] technology delivers following advantages to wind turbines: 1. Higher energy production or Efficiency 2. Reductionin stresses & resonance meaning reduced operating cost & longer life of assets 3. Making wind turbines more grid friendly entailing more energy sales Cumulatively, windTRAIN[™] technology can increases revenue output of a turbine by 15% based on site and grid conditions. Financial simulation suggests windTRAIN[™] technology to have a global market potential to the tune of 1.8 Billion USD annually for an estimated market impact size of 10%. Baud's revenue is expected to come, in form of license fee and profit sharing (or royalties) through Manufacturer and through design engineering and

consultancy services to wind farm operator or developer. windTRAIN[™] technology has enormous impact on the grid stability of turbines, by advance speed momentum control. It thus reduces the number of power curtailment events occurring in a year due to fluctuating power outputs and grid stability issues and hence provide an increment in power output & reliability at wind farm



level. windTRAIN[™] technology can be used to smoothen out the acceleration and deceleration of the turbine when rapidly fluctuating aerodynamic loads are present thus reducing the detrimental stresses. This entails reduced O&M cost, while increasing the life cycle of the asset. The team is currently in the middle of development and analysis of their new controller design, which entails operating a test case turbine in controlled environment and publishing results. If Baud Resources is an establishment at which you could see yourself fitting in, try dropping your CV at <u>desk@baudresources.com</u>.

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Amazing Innovation

CHANGING FOCUS OF A CAMERA LENS WITHOUT ANY MOVING PARTS



A new development from the Materials Research team at MIT claims to be able to focus light quickly and accurately using a transparent phase-shifting material that doesn't need to move at all. Instead, this "ultrathin tunable meta-lens" rearranges its atomic structure in response to heat. The material in question is a new twist on the germanium/antimony/tellurium material used in re-writable CDs and DVDs. In those

applications, laser heat was used to switch the material between transparent and opaque states. But the MIT team added selenium to the mix, and found that when heat was added, its atomic structure "shifted from an amorphous, random tangle of atoms to a more ordered, crystalline structure," altering its refracting power without changing its transparency. This infra-red prototype, says the team, could be useful in miniature heat scopes, ultra-compact thermal cameras and low-profile night vision goggles. Further developments, it says, could enable ultra-compact zoom lenses for smartphones with no moving parts, among other things.

Source: https://newatlas.com/photography/mit-metalens/

Amazing Innovation

SOFT ROBOTIC GRASPER CHANNELS THE VENUS FLYTRAP



Developed by a team of scientists from China's Southeast University, the experimental grasper was inspired by plants such as the Venus flytrap. The researchers started with a slab of a polymer known as a liquid crystal elastomer (LCE), which changes its shape in response to changes in temperature. They then applied a liquid metal (nickel-infused galliumindium alloy) to its surface, which they magnetically

arranged into lines, forming an uninterrupted circuit. Finally, they sealed that circuit with a layer of silicone. When an electrical current is run through that circuit, a small amount of heat is produced within the material. Subsequently applying mechanical pressure to the grasping surface stretches the circuit, causing the current and thus the material's temperature to drop. As a result, the LCE curls inward. Easing off on the pressure allows it to return to its default flat state. In this fashion, the scientists were able to grip small objects by pressing the grasper against them, causing it to curl. Those items could then be lifted, moved, and then dropped as the grasper uncurled after the initial pressure was released.

Source: https://newatlas.com/robotics/soft-robotic-grasper/

Alumni Writeup

I have an idea of startup but I don't have enough funding to start. I need investors and some team members. How to start this? How to approach them?

Hi. This is an interesting question. First make a business plan to show the monetary benefit of the idea. Then make a working prototype. Investors continuously hold competitions to evaluate the best idea. So by then a team should be ready. Getting a ready would be the easy part. Choose people according to what has to be done on the idea. For example, someone for manufacturing, someone for coding etc. Peers with expertise in the functions required should be selected.

Arul Noble Jose Rohan, Founder, Chennai Society of Inventors and Ecofreaks.

Alumni Visit to campus

Avneesh S Manian – 2015- 2019 batch – visited the campus on 4/1/2021. He is currently pursuing M.Tech at IIT Bombay.

Renius Abraham J 2015- 2019 batch – visited the campus on 7/1/21. He is currently the senior team member at TVS Eurogrip, Madurai.

Alumni Documentation Series (Refer Mail sent for more details)

- 1. Akshay Aravindhan Provided a document "Applying for MS?". The document serves as a guide to the students applying for MS.
- 2. Sesha Gopalan Provided a document that answered questions like
- 3. What are chances for a Lateral Entry student to pursue higher studies?
- 4. How are the job opportunities after completing both a diploma and a Bachelors in Engineering?
- 5. Are there any other options for Lateral Entry students other than sitting for placements?

Alumni Contribution for Curriculum Revision:

The following Alumni provided their inputs for curriculum revision.

- 1. Gnana Rajan
- 2. Akhilanand Ramesh
- 3. Venkat Raman
- 4. Dhruv
- 5. Subramanian R
- 6. Deepak Vishal

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Research news and Forthcoming event

Biotechnology Industry Research Assistance Council (BIRAC)

BIRAC Announces 18th Call for Proposals under the Biotechnology Ignition Grant BIG Scheme

> Last date for submission of the project proposal: 15-March-2021 https://www.birac.nic.in/cfp.php

Council of Scientific and Industrial Research

Collaborative Research Support Programme Under New Idea Fund Scheme The proposals in the prescribed format should be submitted to DG, CSIR Last date for submission of the project proposal: Twice in a year i.e. on or before 15 September or 15 March.

https://www.csir.res.in/sites/default/files/The_scheme_Collobarative.pdf

Department of Health and Human Services – Administration for Children and Families – OCS Community Services Block Grant (CSBG) CARES Act Rapid-Cycle Impact Projects Last date for submission of the project proposal: 21-March-2021 https://www.grants.gov/web/grants/search-grants.html

Department of Science and Technology (DST)

GRAND CHALLENGE – BIOMEDICAL DEVICE AND TECHNOLOGY DEVELOPMENT PROGRAMME Last date for submission of the project proposal: 31-March-2021 https://www.grants.gov/web/grants/search-grants.html

Department of Science and Technology (DST)

Call for proposals under the National Health and Risk Communication program "Year of Awareness on Science and Health (YASH) for COVID 19" Last date for submission of the project proposal: 31-March-2021 https://dst.gov.in/sites/default/files/YASH%20Backgrounder.pdf

Department Of Science and Technology (DST) The India-Israel Industrial R&D and Technological Innovation Fund (I4F) R&D projects in all areas but will prioritize the areas of: Agriculture, Energy, Healthcare, Information & Communication Technologies (ICT) Water Last date for submission of the project proposal: 03 May 2021 https://www.gita.org.in/OnlineRfp/ProgramInfo.aspx?GITA=kZdo4yRVS4gRExygXA1GyqV byWB3io23meK0IVIdjpY=			
Department of Health and Human Services Administration for Children & Families –			
ACYF/FYSB			
Personal Responsibility Education Program Innovative Strategies (PREIS)			
Last date for submission of the project proposal: 20-May-2021			
https://www.grants.gov/web/grants/search-grants.html			
Department of Science and Technology (DST) India-Sweden Collaborative Industrial Research & Development Programme 2020 on "Smart Grid" Request for Proposal (RFP), Common Application Form & Guidelines for Indian Participants			
Last date for submission of the project proposal: 20-May-2021			
https://dst.gov.in/sites/default/files/India-			
Sweden%20Collaborative%20Industrial%20Research%20%26%20Development%20Progra			
mme%202020%20on%20Smart%20Grid%20.pdf			
National Aeronautics and Space Administration NASA Johnson Space Center 2020 Human Exploration Research Opportunities (HERO) Last date for submission of the project proposal: 30-Jul-2021 https://www.grants.gov/web/grants/search-grants.html			



Should you desire a career in the fast unfolding Digital World of Practice, I invite you to apply for the program at <u>https://sme-snu.nopaperforms.com/dsab-application-form</u>For any queries, feel free to reach out to Rajesh Maji, Sr. Program Manager, DSAB at <u>rajesh.maji@snu.edu.in</u> or call him at **99993 40823**

ADMISSION TO Ph.D. PROGRAMME JULY 2021 SESSION

in

Anna University Recognised Research Centres Sri Sivasubramaniya Nadar College of Engineering

Chemical Engineering (4131503), Mechanical Engineering (4131517), Electronics and Communication Engineering (4131507), Electrical and Electronics Engineering (4131508), English (4131510), Information Technology (4131513), Bio-Medical Engineering (4131525), Mathematics (4131515), Chemistry (4131504), Physics (4131520), Computer Science and Engineering (4131506)

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submission (36 Months)	accommodation	Shared
		accommodation
PhD Scholar after Synopsis	Rs 18000 + Rent free Shared	Rs 15000 + Rent free
submission	accommodation	Shared
(12 months)		accommodation



Last Date of Application: 20 March 2021

Inspiring Life Stories

Secret to Success

Once a young man asked the wise man, Socrates, the secret to success. Socrates patiently listened to the man's question and told him to meet him near the river the next morning for the answer. The next morning Socrates asked the young man to



walk with him towards the river. As they went in the river the water got up to their neck. But to the young man's surprise Socrates ducked him into the water.

The young man struggled to get out of the water, but Socrates was strong and kept him there until the boy started turning blue. Socrates pulled the man's head out of the water. The young man gasps and took a deep breath of air. Socrates asked, 'What did you want the most when your head was in the water?" The young man replied, "Air." Socrates said, "That is the secret to success. When you want success as badly as you wanted the air while you were in the water, then you will get it. There is no other secret."

Moral: A burning desire is the starting point of all accomplishment. Just like a small fire cannot give much heat, a weak desire cannot produce great results.

Source: https://alltimeshortstories.com/short-stories-about-life/

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