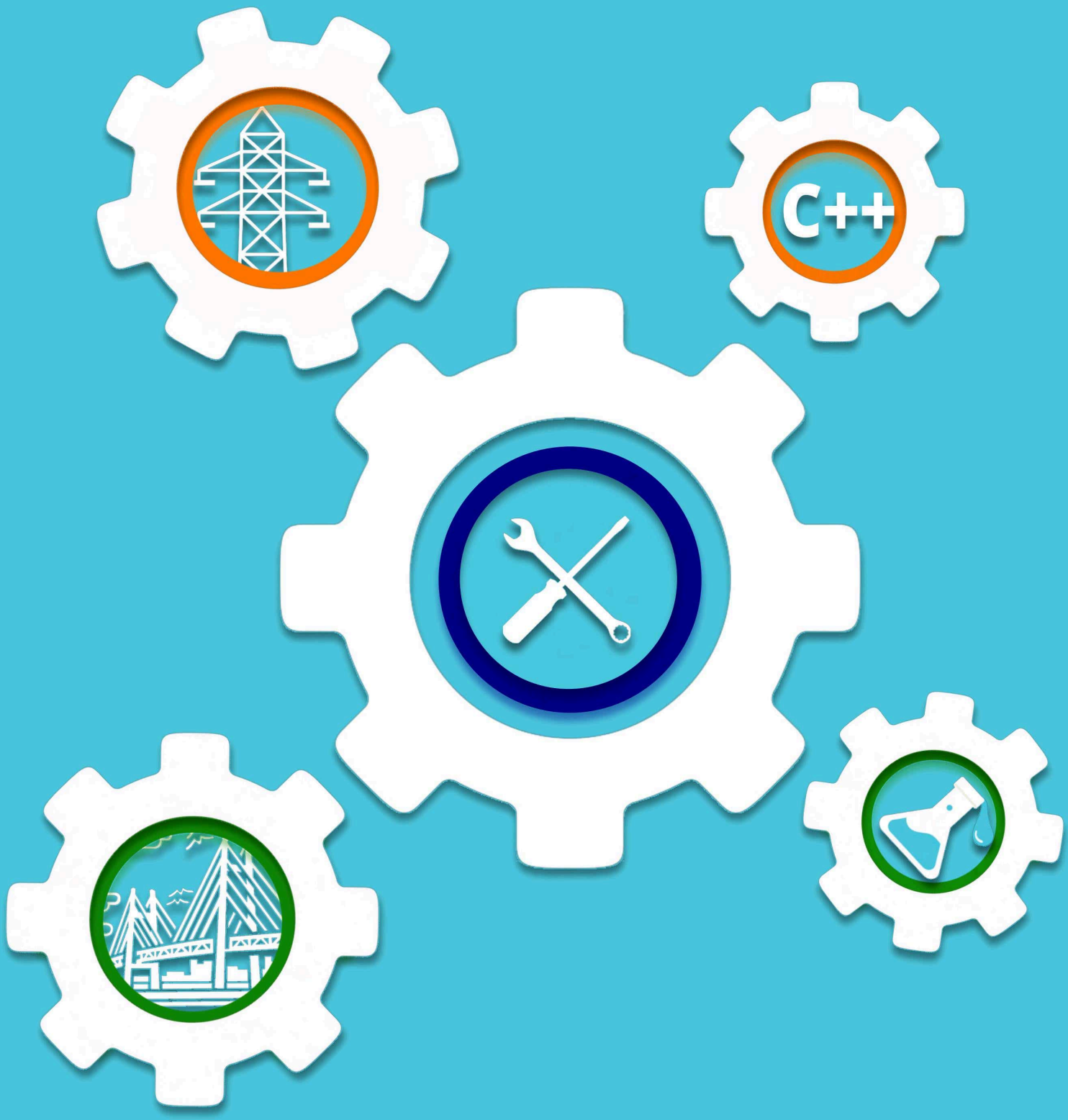
January 2020 - December 2021 Newsletter

MECH EXPRESS

Department of Mechanical Engineering



Sardar Vallabhbhai National Institute of Technology, Surat

VISION

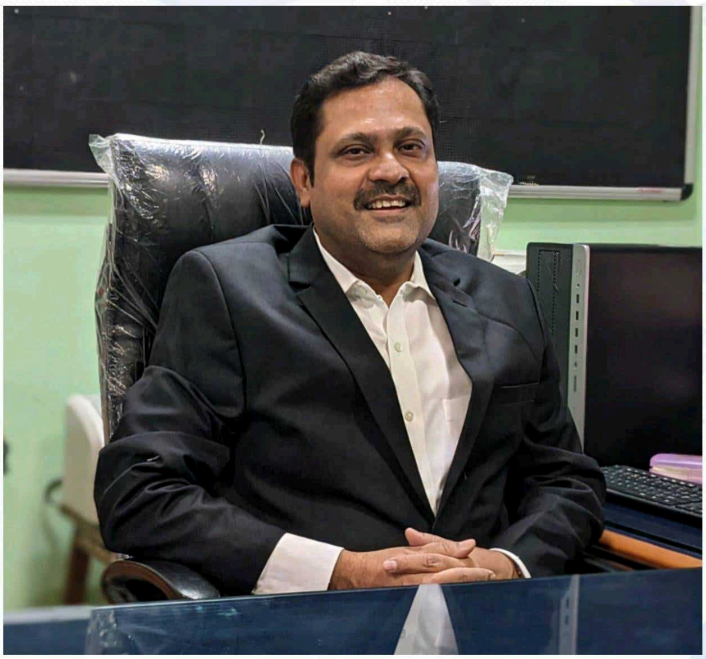
Department of Mechanical Engineering, Sardar Vallabhbhai National Institute of Technology, Surat perceives to be globally accepted centre of quality technical education based on innovation and academic excellence.

MISSION

Department of Mechanical Engineering, Sardar Vallabhbhai National Institute of Technology, Surat strives to disseminate technical knowledge to its undergraduate, post graduate and research scholars to meet intellectual, ethical and career challenges for sustainable growth of humanity, nation, and global community.

MECH EXPRESS
CONTENTS

FROM THE HOD'S DESK



Competence is the most important Professional Ethics. Competence however, is a synergetic combination of skill, knowledge and attitude. While the faculty of Mechanical Engineering is striving hard to help student acquire the right skill set and the knowledge base required to be a better professional, attitude has to be inculcated by the student. My advice to the students of the department is to develop the habit of being enthusiastic, passionate and patient to acquire the positive attitude.

Nothing great has ever been achieved without enthusiasm. Students must allow their passion to become their purpose and someday it will become their profession. Positive attitude gives you the power over your circumstances, rather than your circumstances overpowering you. Our country is unique in its diversity and socio-economic challenges in both urban and rural areas. Students must be open minded to identify such challenges and address them with their technical knowledge. A positive attitude can help students to be an entrepreneur and find low cost solution to many of the techno-economic challenges the country is facing.

I am happy to witness the Newsletter of the Department of Mechanical Engineering being developed by the combined effort of our faculty and students. This Newsletter provides a summary of activities and achievements of the department in the years 2020 and 2021. It provides an insight on the research, development and entrepreneurship activities of the department and the short term training programs and conferences organised and proposed to be organised by the department. I congratulate the team of faculty coordinators and student coordinators who have put their best efforts to develop the Newsletter.

NEWLY JOINED FACULTIES

Dr. Rayasam Srilakshmi
Email id: srilakshmi_r@med.svnit.ac.in
Specializations: Machine Design

Area of Specialization
Fracture mechanics, Finite element analysis, Computational fracture and damage mechanics, Study of fatigue behavior of aircraft panels, Dynamic response of damaged panels.

Dr. Neeraj Srivastava
Email id: neeraj.s@med.svnit.ac.in
Specializations: Metallurgy

Area of Specialization
Solidification processing of light alloys, Composites and foams using conventional and non - conventional solidification techniques, Microstructural and mechanical characterizations, Mechanical metallurgy.

Dr. Rajesh Choudhary
Email id: rchoudhary@med.svnit.ac.in
Specializations: Thermal Engineering

Area of Specialization
Heat transfer in nano-fluids, Ventilation systems in the buildings, Refrigeration and air – conditioning systems, Computational fluid dynamics, Plastic and biomedical waste management.

Dr. Krishna Kishore Mugada
Email id: kkm@med.svnit.ac.in
Specializations: Manufacturing

Area of Specialization
Friction stir welding and processing, Dissimilar metals joining, Resistance spot welding, Cold metal transfer, Hybrid welding and joining, Microstructure and materials processing, Wire arc additive Manufacturing.

Dr. Amit Kumar
Email id: amitkumar@med.svnit.ac.in
Specializations: Metallurgy

Area of Specialization
Mechanical metallurgy, Processing - texture relationship, Deformation and thermo-mechanical processing, Microstructure-mechanical property correlation, Welding of metals and alloys.

Dr. Raju Prasad Mahto
Email id: rpm@med.svnit.ac.in
Specializations: Manufacturing Engineering

Area of Specialization
Additive manufacturing, Welding and joining, Material processing, Industry 4.0

Dr. Ram Singar Yadav
Email id: rsy@med.svnit.ac.in
Specializations: Manufacturing Engineering

Area of Specialization
Advanced machining processes, Unconventional machining, Hybrid machining, Conventional machining processes, Advanced engineering materials

Dr. Sorate Kamalesh Arun
Email Id: kasorate@med.svnit.ac.in
Specializations: Thermal Engineering

Area of Specialization : Bio - fuels, I.C. engines, Alternate energy sources, Renewable energy.

Dr. Sunil Kumar
Email id: sunilkumar@med.svnit.ac.in
Specializations: Manufacturing Engineering

Area of Specialization : Plasticity, Metal forming, Severe plastic, deformation, Mechanics of materials.

Dr. Susanta Behera
Email id: susanta.b@med.svnit.ac.in
Specializations: Machine Design

Area of Specialization : Composites, Smart materials and structures, Analytical and numerical methods

Dr. Yogendra Vasantrao
Email id: yvk@med.svnit.ac.in
Specializations: Thermal Engineering

Area of Specialization : Thermal and heat transfer, refrigeration and air conditioning, Cryogenics.

EVENTS

EVENTS ORGANISED

COORDINATORS	PROGRAMME NAME	PERIOD
INTERNATIONAL CONFERENCES		
Dr. S. Kumar Dr. H. K. Dave	Recent Advances in Manufacturing	03-05 July, 2020
Dr. B. M. Sutaria Dr. Sandeep Soni Dr. Achchhelal	Recent Advancements in Design and Manufacturing	16-17 July, 2020
Dr. S. Kumar Dr. H. K. Dave	Recent Advances in Manufacturing	10-12 June, 2021
Dr. J. Banerjee Dr. H. B. Mehta Dr. R. D. Shah Dr. M. K. Rathod	Thermal and Fluid Flow and Thermal Sciences	24-25 September, 2021
Dr. B. M. Sutaria Dr. Sandeep Soni Dr. Sumit Khare	Advancements in Design and Tribology	17-18 December, 2021
NATIONAL CONFERENCES		
Dr. B. M. Sutaria Dr. H. B. Mehta	Advances in Mechanical Engineering	27-28 May, 2021
Dr. Vimal K. Patel Dr. Vikram P. Rathod Dr. P. V. Bhale Dr. A. D. Parekh	Turbomachines, Energy and Combustion	29-30 November, 2021
SHORT TERM TRAINING PROGRAMMES (STTP)		
Dr. A. A. Shaikh	Reverse Engineering for product design	6-10 January, 2020

COORDINATORS	PROGRAMME NAME	PERIOD
Dr. S. Kumar Dr. H. K. Dave	Advances in Manufacturing	21-25 January, 2020
Dr. Pawan Sharma Dr. B. N. Sahoo Dr. Amrut Mulay	Modern Materials and Manufacturing	12-18 October, 2020
Dr. S. Kumar Dr. H. K. Dave	Advances in Manufacturing - AIM 2.0	5-9 October, 2020
Dr. Dinesh Singh Dr. Ravi Kant	Multiple Attribute Decision Making and its Industrial Applications	2-6 November, 2020
Dr. Dinesh Singh Dr. Ravi Kant	Research Methodology: Tools and Techniques	30 November - 4 December, 2020
Dr. H.B. Mehta Dr. Vipul M. Patel Dr. Rohan Pande	Fundamentals and Modelling of CFD	21-25 December, 2020
Dr. Dinesh Singh Dr. Ravi Kant	Multiple Attribute Decision Making and Its Industrial Applications –II	21-25 December, 2020
Dr. Sandeep Soni Dr. B. M. Sutaria	Basics of Tribology and its Industrial Engineering Applications	4-8 January, 2021
Dr. Ravi Kant Dr. Dinesh Singh	Research Methodology: Tools and Techniques –II	1-5 February, 2021
Dr. Ravi Kant Dr. Dinesh Singh	Research Methodology: Tools and Techniques – III	8-12 March, 2021
Dr. Ravi Kant Dr. Dinesh Singh	Multiple Attribute Decision Making and Its Industrial Applications –III	15-19 March, 2021
Dr. H. B. Mehta Dr. V. M. Patel Dr. Rohan Pande	CFD Part II	16-20 August, 2021
Dr. R. Srilakshmi Dr. Sumit Khare Dr. Rohit Tamrakar	Advanced Structural, Aerodynamic analysis & Composite Modeling using ANSYS	13-17 December, 2021

COORDINATORS	PROGRAMME NAME	PERIOD
Dr. R. V. Rao	Advanced Engineering Optimization Through Intelligent Techniques (AEOTIT)	18-22 October, 2021
WORKSHOPS		
Dr. A. A. Shaikh	Fatigue engineering analysis and simulation tools	15-16 February, 2020
Dr. Prabhansu Dr. Naresh Yarramsetty Dr. Nikhil Baraiya	Thermal Systems Design and Analysis using COMSOL	25-29 October, 2021
FACULTY DEVELOPMENT PROGRAMMES (FDP)		
Dr. V. D. Kalyankar	Reality based welding simulator: Significance, virtual training and industrial correlation	18-22 January, 2021
Dr. S. Kumar Dr. H. K. Dave	Advances in Manufacturing (AIM) 3.0	4-8 January, 2021
STUDENT'S WORKSHOP		
Mr. Viraj Mehta	Getting Started with Inventor	14 February - 3 May, 2021
Mr. Viraj Mehta	Getting Started with Ansys	29 August - 21 November, 2021

UPCOMING EVENTS

COORDINATORS	PROGRAMME NAME	PERIOD
Dr. Ravi Kant Dr. Dinesh Singh	STTP on Research Methodology: Tools and Techniques	1-5 February, 2022 (online mode)
Dr. R. V. Rao Dr. Pallvita Yadav	International Conference on Advanced Engineering Optimization Through Intelligent Techniques (AEOTIT)	28-30 January, 2022 (online mode)

SALIENT PUBLICATIONS

With High Impact Factor

(As per the Annual Report July 2020 – June 2021)

- **R. V. Rao, H. S. Keesari**, A self-adaptive population Rao algorithm for optimization of selected bio-energy systems, Journal of Computational Design and Engineering, Oxford University Press, 8(1), 69-96, 2021. (**Impact Factor: 5.86)**

- **A. Taheri, K. R. Zadeh, R. V. Rao**, An efficient Balanced Teaching-Learning-Based optimization algorithm with Individual restarting strategy for solving global optimization problems, Information Sciences, Elsevier, 576, 68-104, 2021. (**Impact Factor: 6.79)**

- **R. V. Rao, R. B. Pawar**, Quasi-oppositional-based Rao algorithms for multi-objective design optimization of selected heat sinks, Journal of Computational Design and Engineering, Oxford University Press, 7(6), 830-863, 2020. (**Impact Factor: 5.86)**

- **R. V. Rao, H. S. Keesari**, Rao algorithms for multi-objective optimization of selected thermodynamic cycles, Engineering with Computers, Springer, 37, 3409–3437, 2021. (**Impact Factor: 7.96)**

- **S. Tiachacht, S. Khatir, C. T. Le, R. V. Rao, S. Mirjalili, M. A. Wahab**, Inverse problem for dynamic structural health monitoring based on slime mould algorithm, Engineering with Computers, Springer, 2021. (**Impact Factor: 7.96)**

- **Jay R. Patel, Rathod Manish K.**, Recent developments in the passive and hybrid thermal management techniques of lithium-ion batteries. Journal of Power Sources. Vol. 480, 228820, 2020. (**Impact Factor: 9.13)**

- **Bhamare Dnyandip K., Manish K. Rathod, and Jyotirmay Banerjee**, Numerical model for evaluating thermal performance of residential building roof integrated with inclined phase change material (PCM) layer, Journal of Building Engineering, 28, 2020,101018. (**Impact Factor: 5.7)**

- **Bhamare Dnyandip K., Manish K. Rathod, and Jyotirmay Banerjee**, Evaluation of cooling potential of passive strategies using bioclimatic approach for different Indian climatic zones, Journal of Building Engineering, Vol. No. 31, 2020, 101356. (**Impact Factor: 5.7)**

- **Digant S. Mehta, Bhavesh Vaghela, Manish K. Rathod, Jyotirmay Banerjee**, Thermal performance augmentation in latent heat storage unit using spiral fin: An experimental analysis, Journal of Energy Storage, Vol. No. 31, 2020,101776. (**Impact Factor: 6.87)**

- **Dnyandip K. Bhamare, Rathod Manish K. and Jyotirmay Banerjee**, Selection of phase change material and establishment of thermophysical properties of phase change material integrated with roof of a building using Measure of Key Response index: proposal of a new parameter., Journal of Energy Storage, Vol. No. 32, 2020, 101812. **(Impact Factor: 6.87)**

- **Dnyandip K. Bhamare, Rathod Manish K. and Jyotirmay Banerjee**, A bioclimatic assessment tool for investigating the potential of passive cooling strategies for distinct climatic zones of India, Journal of Building Engineering, Vol. No. 31,2020, 101356. (**Impact Factor: 5.7)**

- **Dnyandip K. Bhamare, Rathod Manish K., Rakhsit D. and Jyotirmay Banerjee**, A machine learning and deep learning based approach to predict the thermal performance of phase change material integrated building envelope, Building and Environment, Vol. No. 199, 2021, 107927. (**Impact Factor: 6.9)**

- **Dnyandip K. Bhamare, Rathod Manish K. and Jyotirmay Banerjee**, Proposal of a unique index for selection of optimum phase change material for effective thermal performance of a building envelope, Solar Energy, Vol. No. 218, 2021, 129-141. (**Impact Factor: 5.95)**

- **Shete P. C., Ansari Z. N., Kant R.**, A Pythagorean fuzzy AHP approach and its application to evaluate the enablers of sustainable supply chain innovation, Sustainable Production and Consumption, 23, pp. 77-93. (**Impact Factor: 5.34)**

- **Lahane S., Kant R., Shankar R.**, Circular supply chain management: A state-of-art review and future opportunities, Journal of Cleaner Production, 258, pp. 120859. (**Impact Factor: 9.56)**

- **S. Vaishak, PV Bhale**, Investigation on the effect of different backsheet materials on performance characteristics of a photovoltaic/thermal (PV/T) system, Renewable Energy, Elsevier 160-169, 2021. (**Impact Factor: 8.39)**

- **N. A. Baraiya, V. Ramanan, N. Baladandayuthapani, C. S. Vegad and S. R. Chakravarthy**. "Role of pumping and wrinkle propagation mechanisms in exciting different acoustic-modes in turbulent syngas combustion", International Journal of Hydrogen Energy, Elsevier, 13413-13429, 2021. (**Impact Factor: 5.75)**

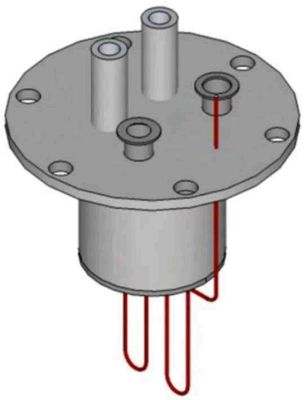
- **Iqbal M. P., Tripathi A., Jain R., Mahto R. P., Pal S. K., Mandal P**. Numerical modelling of microstructure in friction stir welding of aluminium alloys. International Journal of Mechanical Sciences, 2020;185. doi:10.1016/j.ijmecsci.2020.105882. (**Impact Factor: 5.48)**

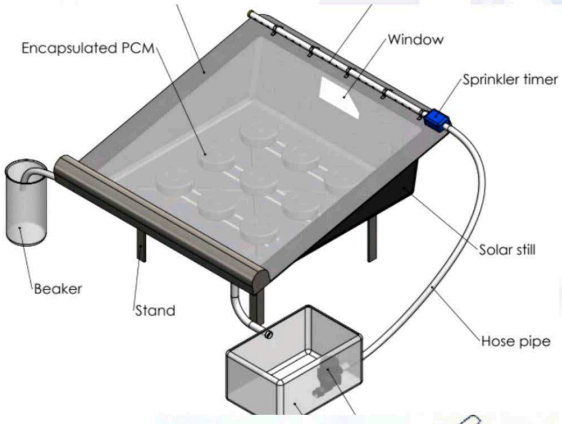
PATENT

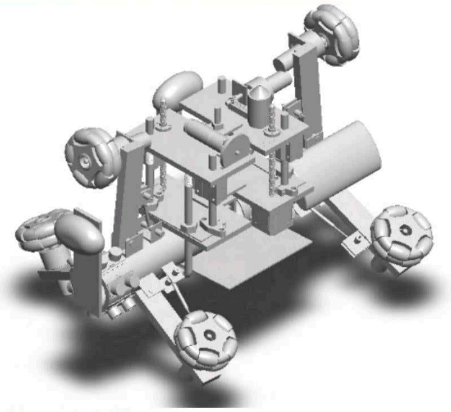
Patents and Design Registrations are listed below

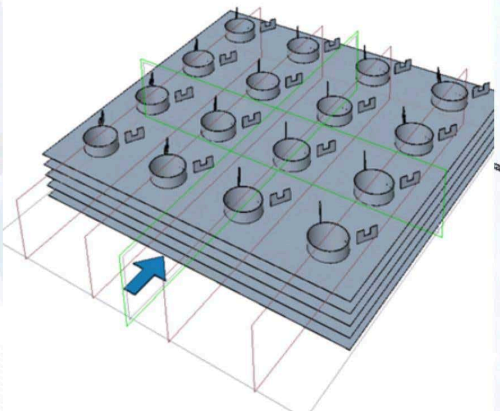
INVENTOR	TITLE OF PATENT	CO-INVENTOR	PATENT NO.
Dr. Pawan Sharma	"A Process of Preparation of Ordered Cell Metal Foam"	Mr. Pulak Mohan Pandey Mr. Jatender Pal Singh	347561
Dr. Beena D. Baloni	"Wind Turbine Blade"	Mr. Neeraj Verma	334553-001
Dr. Pawan Sharma	"System and Method for Rapid Manufacturing of Article"	Mr. Pulak Mohan Pandey Mr. Gurminder Singh	359912
Dr. Harshit K Dave	"Developing a Non Contact Type Robot Which Works to Detect Faults in Vertical Pipe System"	Mr. Pratham Choukse Mr. Neel Majethiya Mr. Amit Panigrahi Mr. Dheerendra Prajapati Mr. Kush Dasadia	337173-001
Dr. Shailendra kumar	"Design a Novel Fixture for Shear Testing of Sandwich Structures on Universal Testing Machine"	Mr. Swapnil Vyavhare Mr. Soham Teraiya	332670-001
Dr. Manish K Rathod	"PCM Integrated Solar Still with Water Sprinkler Arrangement"	Mr. Varun V Joshi	323395-001
Dr. Manish K Rathod	"Thermal Cycler For Phase Change Materials (PCM)"	-	320329-001
Dr. Hemantkumar B Mehta	"Stepped Variable Channel Width Minichannel Heat Sink"	Mr. Nishant M Shah Dr. Jyotirmay Banerjee	332650-001
Dr. Hemantkumar B Mehta	"Pin Finned Embedded Stepped Minichannel Heat Sink"	Mr. Nishant M Shah Dr. Jyotirmay Banerjee	332649-001

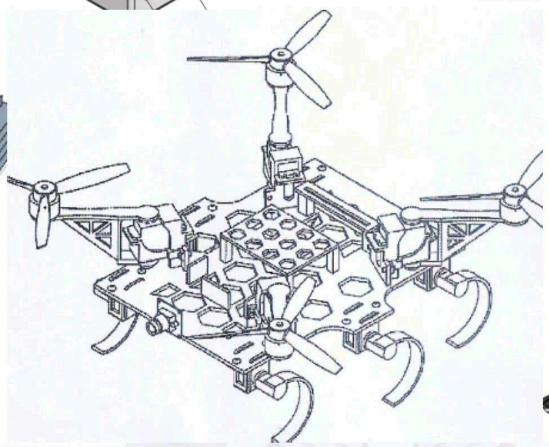
INVENTOR	TITLE OF PATENT	CO-INVENTOR	PATENT NO.
Dr. Harshit K Dave	"Agriculture Monitoring Drone with Land Traversing Feature"	-	332649-001
Dr. Hemantkumar B Mehta	"Cryogenic Pulsating Heat Pipe wih Cylindrical Shell type Condenser"	Mr. Kalpak Sagar Dr. H B Naik	343124-001
Dr. Manish K Rathod	"Fin and Tube Heat Exchanger with Trapezoidal Notch Type Vortex Generator"	Mr. Ashishkumar J Modi	343882-001
Dr. Harshit K Dave	"Lower Limb Exoskeleton"	Mr. Param V Bhavsar Mr. Manan K Gohil Mr. Harshit A Kakadiya Mr. Sunny Bagde Mr. Pratik Patel	343881-001
Dr. Dhananjay V Bhatt	"Supportive Motion Assembly for Bicycle Drive Train (CBE No. 8586)"	Mr. Pratham Choukse Mr. Neel Majethiya Mr. Amit Panigrahi Mr. Dheerendra Prajapati Mr. Kush Dasadia	337173-001











HEROES OF SVNIT

Stanford University's Prof John PA Loannidis and his team prepared by the report and was published by Elsevier.

વિશ્વના ટોચના બે ટકા વૈજ્ઞાનિકોના યાદીમાં SVNITના ૬ પ્રાધ્યાપક

સુરત, બુધવાર

(પ્રતિનિધિ દ્વારા)

વિશ્વભરના વૈજ્ઞાનિકો દ્વારા ૨૦૨૦ ના અંત સુધીમાં રીસર્ચ પ્રકાશનોના ડેટા વિશ્લેષણના આધારે યુ.એસ.એની સ્ટેન્ડફોર્ડ યુનિવર્સિટી અને નેધરલેન્ડના સંશોધકો દ્વારા વિશ્વના ટોચના વૈજ્ઞાનિકોની પ્રસિદ્ધ કરેલી યાદીમાં સુરતની સરદાર વલ્લભભાઈ નેશનલ ઈન્સ્ટીટયુટના છ પ્રાધ્યાપકોનો સમાવેશ કરાયો છે.

પર્સેન્ટાઈલ રેન્ક બેથી વધારે હોય

વૈજ્ઞાનિકોની યાદી બનાવી બે ટકા

સ્ટેન્ડફોર્ડ યુનિવર્સિટી યુ.એસ.એ અને નેધરલેન્ડના સંશોધકોએ જેમનો પર્સેન્ટાઈલ રેન્ક બે કે તેથી વધુ હોય તેવા ૧ લાખ

આ પ્રોફેસરોને યાદીમાં સ્થાન મળ્યું

૧. પ્રો.ડો.આર.વી.રાવ (મિકેનિકલ એન્જિનિયરીંગ)
૨. પ્રો.ડો.ઝેડ.વી.પી.મૂરથી (કેમિકલ એન્જિનિયરીંગ)
૩. પ્રો.ડો.કે.સુરેશ (કેમેસ્ટ્રી)
૪. પ્રો.ડો.એસ.કે.શાહુ (કેમેસ્ટ્રી)
૫. પ્રો.ડો.એસ.આર.આર્યો (ઈલેકટ્રીકલ એન્જિનિયિરીંગ)
૬. પ્રો.ડો.એમ.કે.રાઠોડ (મિકેનીકલ એન્જિનિયરીંગ)

SVNITના છ અધ્યાપકોને વિશ્વના ટોચના બે ટકા વૈજ્ઞાનિકોમાં સમાવાયા

सूरत : दुनिया के शीर्ष 1 लाख वैज्ञानिकों में एसवीएनआईटी के 6 प्रोफेसरों का समावेश

DHARMENDRA MISHRA 2021-11-04 17:53:59

THE TIMES OF INDIA

City Surat Mumbai Delhi Bengaluru Hyderabad Kolkata Chennai Agra Agartala Ahmedabad Ajmer Allahabad Amaravati ...

WEATHER GUJARAT ELECTIONS

NEWS / CITY NEWS / SURAT NEWS / Six SVNIT Researchers Among Top Int'l Scientists

Six SVNIT researchers among top int'l scientists

एसवीएनआईटी की फाइल तस्वीर

प्रो.आर. वी.राव समग्र देशभर में प्रथम, डॉ. के. सुरेश कुमार 17वें एवं प्रो. जेड.वी.पी. मूरथी 51 वें स्थान पर

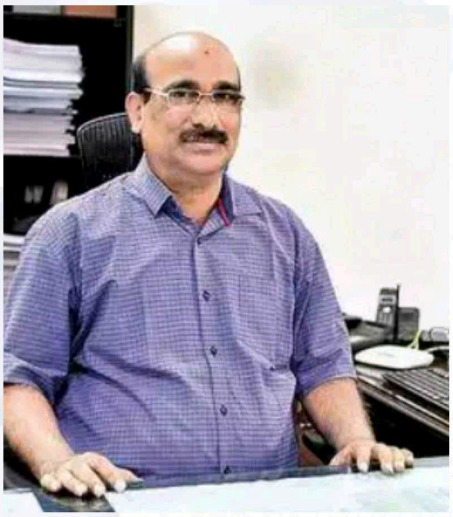
संयुक्त राज्य अमेरिका में स्टैन्डफोर्ड विश्वविद्यालय और नीदरलैंड में एल्सेवियर के शोधकर्ताओं ने 2020 के अंत तक शोध प्रकाशनों के विश्लेषण के आधार पर दुनिया के शीर्ष 2% वैज्ञानिकों की एक सूची जारी की। इसमें सूरत एसवीएनआईटी के 6 प्रोफेसर शामिल हैं। इसमें वे वैज्ञानिक शामिल हैं जो समग्र प्रशस्ति पत्र सूचकांक के आधार पर सभी क्षेत्रों में शीर्ष 1 लाख वैज्ञानिकों में शामिल हैं। शीर्ष 2% वैज्ञानिकों की 2 सूचियां सामने आई हैं।

पहली सूची में कैरियर लांग डेटा पर आधारित है जिसमें मैकेनिकल इंजीनियरिंग के प्रोफेसर आर. वी. राव, इंजीनियरिंग के प्रोफेसर जेड. वी. पी. मूर और रसायन विज्ञान के डॉ. एस. सुरेश कुमार शामिल हैं। दूसरी सूची में एसवीएनआईटी सूरत ते छह प्रोफेसर शामिल हैं। जिसमें रसायन शास्त्र के डॉ. एस.के. साहू, इलेक्ट्रिकल इंजीनियरिंग के डॉ. एस. आर. आचार्य के साथ-साथ मैकेनिकल इंजीनियरिंग के डॉ. एम.के. राठोड शामिल हैं।

प्रोफेसर आर.वी. राव और प्रोफेसर जेड.वी.पी. मुर पिछले साल भी शीर्ष 2% वैज्ञानिकों में शामिल थे। इस वर्ष प्रोफेसर आर. वी राव अपने क्षेत्र में विश्व पद पर हैं और वे पूरे भारत में प्रथम स्थान पर हैं। प्रोफेसर

Stanford University listed 3,352 Indian researchers representing the valuable impact of India on the global research platform. (HT File Photo)

In a report published by Stanford University, USA, and Elsevier of The Netherlands on the World Science Day for Peace and Development, six professors of SVNIT have been featured in the list of the top two per cent researchers and scientists of the world among which two are from Department of Mechanical Engineering.



The present incharge director of SVNIT, Dr R. V. Rao, Professor of Department of Mechanical Engineering, has been ranked second in the world and first in India for the maximum number of citations of his research papers in the year 2020. He was also ranked on 52nd position in the entire world for the career-long citation impact during 2020. This is a direct consequence of the clarity of Dr. Rao's papers which can be easily understood even by an average reseacher and its capability to solve research problems of different engineering disciplines. He has been working in the field of advanced engineering optimization techniques and their applications. Dr. Rao further aims to work and develop new machine learning techniques which can be applied to solve engineering problems.

Dr Manish Rathod, Assistant Professor of Department of Mechanical Engineering, has been ranked 1518th based on the number of citations of his research paper during the single calendar year 2020. "Based on these rankings, SVNIT researchers will benefit from international tie-ups and collaboration with foreign researchers. Many research-based institutions will approach researchers in SVNIT", said Dr. Manish Rathod to a media outlet.

The oppurtunities and resources provided by SVNIT have played a significant part in this achievement. This feat will help to improve the overall NIRF ranking of the institute, hence increasing the placement and research opportunities for the graduates as well.

SOCIETY OF AUTOMOTIVE ENGINEERS
SAE, SVNIT

The SAE has two divisions , Team Phoenix Racing and Phoenix Aero working in the field of automobiles and aeronautics respectively.

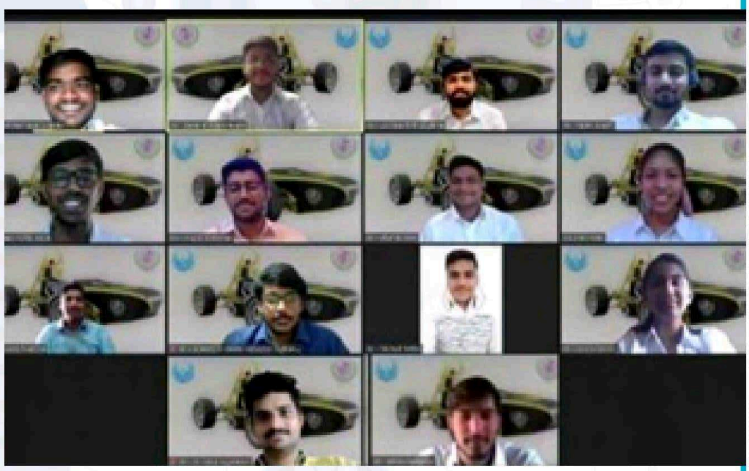
Phoenix Racing has made its mark in various national level competitions including Student Formula cars, All-terrain vehicles, and Electric go-kart. During their stint, the team is in a constant endeavour to design, manufacture and test vehicles with excellent performance and efficiency in a cost-effective manner following their motto “Precision Crafted Performance”.

Phoenix Aero, is the official aero-design team of SVNIT. It is a group of aviation enthusiasts who aim to discover and recreate aerial vehicle’s uncharted cosmos to develope solutions to real-world problems. Established in August 2019, the Student Chapter has seen significant growth. The keen interest in aeromodelling and growing curiosity in this field has motivated the students to work hard. The work carried out by both the team is discussed in next pages.

SOCIETY OF AUTOMOTIVE ENGINEERS
PHOENIX RACING

FORMULA BHARAT 2021

Due to the global pandemic, the competition and the events were held virtually. Even after being hit by the pandemic, the team continued the work and showed a great improvement compared to the previous year and completed the whole event successfully with zero penalties. The team participated in Engineering Design Presentation, Cost Report, and Business Plan Presentation events. The team secured position Overall 13th and 10th position in Engineering Design Presentation. Here is the list of team members who participated in this competition: Shubham Katrodiya, Shulabh Yadav, Devansh Mamrawala, Oorja N. Dorkar, Rajan Swami, Tirth Atulbhai Lodhiya, Pavan Achanta, Shah Jayraj Nandlal, Nishant Mittal, Sagar Shah, Prajapati Jay, Khushali G. Patel, Bhumik Patel, Mehul Agarwal, Sri Satya Jagadeesh, Arunsinh Parmar, Dhola Nikunj, Sahu Gaurav Indrapal, Patel Nil Rajeshbhai, Shaan Polra, Milan Vadgama.



FB 2021
REV - IT

SOCIETY OF AUTOMOTIVE ENGINEERS
PHOENIX RACING

7th Go-Kart Design Challenge (GKDC) 2020

The GKDC is a competition initiated by ISNEE (Indian Society of New Era Engineers) to offer teams maximum design flexibility and the freedom to express their creativity and imaginations with very few restrictions on the overall kart design. In this competition, team phoenix racing designed and manufactured an Electric Go-Kart having a maximum speed of 91 km/h with a Battery life of 33 km at full throttle. The team achieved Overall Champions, Best Endurance, and Best Driver awards. Here is the list of team members who participated in this competition: Rajan Swami, Oorja Dorkar, Shubham Katrodiya, Ayush Jain, Jignesh Barad, Jay Prajapati, Anjali Patel, Khushali Patel, Devansh Mamrawala, Viral Mevada, Siddharth Zadafiya, Sagar Shah, Srinjoy Basak, Shaan Polra, Nishant Mittal, Raghav Shah, Arunsinh Parmar, Darsh Patel, Vinay Senwar, K Vamsi.

E-GKDC Concept Challenge 2020

This competition was organized under GKDC in virtual mode. In this competition, team phoenix racing presented the overall design concept of Electric Go-Kart and secured All India Rank 1. Here is the list of team members who participated in this competition: Shulabh Yadav, Devansh Mamrawala, Shubham Lohar, Prashant Chauhan, Nikhil Khati, Yash Meena, Rushit Prajapati, Rutuja Jadhav, Prabhakar Jaiswal, Janavi Popat.

SOCIETY OF AUTOMOTIVE ENGINEERS
PHOENIX AERO

The team operated virtually for the AY 2020 - 2021 due to the outspread of the COVID-19 pandemic and discontinuation of offline classes. The team successfully completed two projects and filed for a design patent and other publicity events through rigorous planning and execution. Under the leadership of Captain – Dhanush Binu, Vice-Captain – Anup Kamath, Design-Head – Sanskriti Pal, accompanied by 14 B. Tech – II members, the team accomplished the goals as scheduled.

1st Position in Mind Bend 2020's Fly High Aeromodelling Competition

Mind Bend is SVNIT's annual technical festival. It consists of competitions and events covering all areas of engineering exposing students across India to practical engineering. The Flagship Aircraft of Year 2019, 'AtmosX' is designed for the competition and secured overall 1st position in the competition.

Here is the list of team members participated in this competition: Anup Kamath, Dhanush Binu, Sanskriti Pal, Rahul Shah

Aeromodelling Workshop

The team organised a 5-Days workshop during January-February 2021 for students of SVNIT, covering the basics of aeromodelling to provide a concise overview of various procedures involved with designing and manufacturing an RC aircraft.

The workshop was divided into various sessions involving basics of flight principles, various structural components and applications, CAD model designing, CFD and structural analysis, selection and application of avionic components and manufacturing processes involved.

Each workshop was accompanied by a group task to be taken up by the participants. Each task involved implementing the knowledge from the preceding sessions, which gave the participants a hands-on experience on the learnings of each session. The workshop was a grand success and witnessed a huge participant turnout (100+ participants).

SOCIETY OF AUTOMOTIVE ENGINEERS
PHOENIX AERO

Detailed design, performance optimization and payload capacity prediction of lifting body aircraft

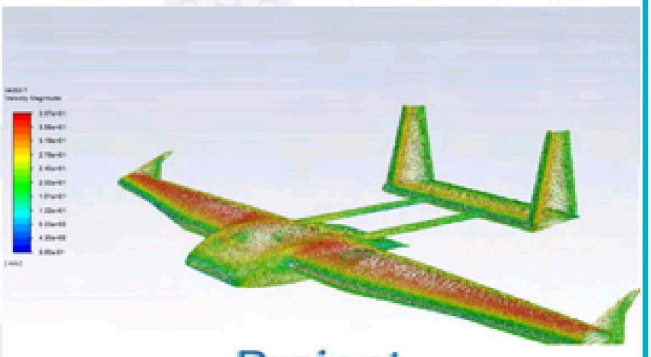
The first project taken up during the year 2020-21 was the Flagship of the Year: 'Xpartan'. An aircraft designed to meet the following objectives:

- Carrying the maximum payload possible by implementing a unique design to the fuselage to make it aerodynamically efficient.
- Designing an empennage configuration that enhances the total aircraft stability.
- The aircraft developed has a wingspan of 2.4m and can carry more than 6 kg of payload.
- The major challenge was to increase the payload capacity and increase the aircraft's total lift.

The team overcame all the challenges and difficulties brought up in front of them and successfully implemented a complete study, detailed technical review forecasting the flight efficacy and payload carrying capability and developed a novel UAV design.

A design patent had been filed on 11 June 2021 for the novelty design features of the aircraft. The application for the article titled, 'Unmanned Cargo Aircraft' has been accepted successfully. Design Patent No. 344532-001, 2021 June.

The list of team members are given below:
Anup Kamath, Priyesh Patel, Dhanush Binu, Pratik Karelia, Sanskriti Pal, Manan Gohil , Shivakshi Sheel Srivastava , Mrinal Manoj Pranjal Bhushan , Param Bhavsar , Sunny Badge, Sharathkumar Vuttur , Mitesh Gandhi, Rahul Patel.



Project

A REVOLUYIONARY CONCEPT

DRISHTI

DRISHTI is the technical-hobby club of SVNIT, which aims to inculcate technical knowledge among the students and represents SVNIT at the national and international levels. The club provide a real-time opportunity to work as a team in a competitive, ethical environment. The club is progressively working and upholding its motive of being a place where "WE comes before ME"

Robocon-2021

Team Drishti has been participating in the ABU ROBOCON competition since 2006. This year also, the team successfully completed stage 1 with a score of 100/100 and is one of the 54 teams who cleared the first stage.

Robofest 2.0

Team Drishti has participated in Robofest 2.0 organised by GUJCOST in the Rover category. The team has qualified for the top three teams and was awarded INR 50,000 to create a proof of concept model for stage 2.

International Planetary Aerial Systems Challenge

Team Drishti participated in the IPAS challenge 2021 conducted by Mars Society South Asia. The team has successfully completed a design and placed 12th out of 26 teams with a score of 496.72.

Smart Car Race Challenge-2021

Four teams from DRISHTI participated in the smart car race challenge-2021 conducted by NXP AIM INDIA. All were finalists in the Grand Finale round after clearing the qualification round.

DOSTAR (Differentially Operated System to Assist Recovery)

Robot Team Drishti has developed a bot DOSTAR with the help of workshop professionals from SVNIT for providing support to society in the best possible way. The bot was handed over to SMIMER Hospital, Surat and is being used to provide meals and other supplies to COVID patients without having to interact with them directly.

CAPTEN (Corona and Pneumonia Testing Networks)

It is a utility that uses deep learning and computer vision to recognize Corona and Pneumonia infections from chest X-ray pictures. The Divya Bhaskar newspaper recognized CAPTEN for its contributions to society on the occasion of National Science Day.

RESEARCH INTERNSHIPS

Many of the students of the department has carried their research internships in order to enhance their skill and augment - practical knowledge in different Research organisations and institutes. Few of them are listed below.

Detection of the Sigmoid in X-Ray wavelength using Deep Learning

Summer Internship at Arya Bhatta Institute of Observational Sciences, Nainital, Uttarakhand, India

Student: Adarsh Mahor

Duration: 2021/07 – 2021/11

Guides: S. Seetha, Uday Shankar

Module for Aditya L1 Telescope; India's First Solar Mission by ISRO.

Here they detected the sigmoidal structure present in the Sun. These sigmoidal structures are responsible for causing many solar eruptions. This can affect the weather and the atmosphere on the earth. Using this module detection of sigmoids will be much faster and automatically labelled which can create a database for sigmoids. These databases will be very useful for research going for Space weather. The data set used here for training the deep learning model is from X- Ray telescope.

Structural and thermal analysis of the antenna for Mission Pratush Satellite launched by ISRO

Internship at Raman Research Institute, Bangalore, Karnataka, India

Student: Adarsh Mahor

Duration: 2021/07 – 2021/11

Guides: S. Seetha, Uday Shankar

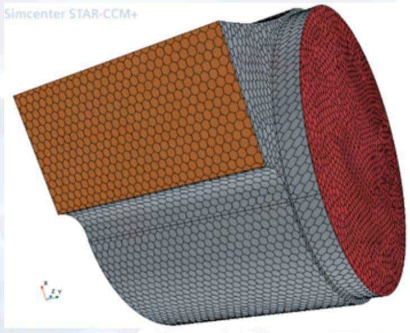
The critical component of radio astronomy radiometers built to detect redshifted 21-cm signals from Cosmic Dawn is the antenna element. The design and performance of an octave bandwidth cone-disc antenna built to detect this signal in the band 40–90 MHz is described. The Cosmic Dawn signal is

predicted to be a wideband spectral feature orders of magnitude weaker than sky and ground radio brightness. Thus, the engineering challenge is to design an antenna at low frequencies that is able to provide with high fidelity the faint cosmological signal, along with foreground sky, to the receiver. Here he did the thermal and structural analysis of a conical monopole antenna. Here the satellite is launched by ISRO and the satellite is going to revolve around the moon.

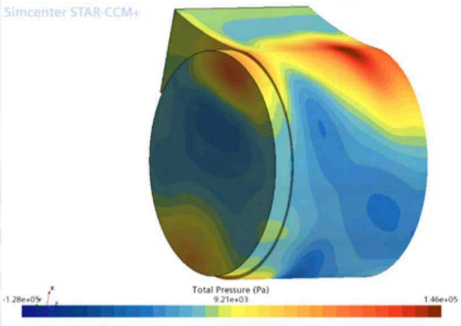
Computational Fluid Dynamics

Indian Institute of Technology, BHU
Student: Aman Vyas
Duration: May 2021- August 2021
Guide: Dr O.P.Singh

Aman Vyas did summer Research Internship in “Computational Fluid Dynamics" at Indian Institute of Technology, BHU, India, under Dr O. P. Singh sir’s guidance. He worked on the effect of turbocharger performance of internal combustion engine and did intense designing of the turbocharger's compressor to get maximum cooling efficiency while running by simulating it at different rpm levels and different vent sizes and patterns to achieve max cooling rate. He took references from the airfoil tool and did the whole simulation using MRF modelling.



The grids of the volute area

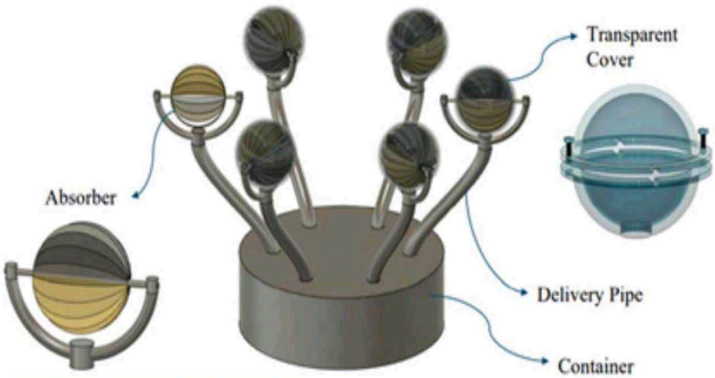


Static pressure contour of non-leaf diffuser and volute surfaces at 110000rpm

Extraction of Water from Air using Desiccant and Solar Energy

Indian Institute of Technology, Roorkee
Student: Yash Paresh Bhardava
Duration: May 2021 - July 2021
Guide: Professor Sudhakar Subudhi

He designed and modelled a water extraction unit shown below using Autodesk Fusion 360 which on average can collect around 3.5kg of water per day from the air. Detailed theoretical calculations and analysis were done using MATLAB to ealuate the performance paramters and efficiency (30.91%) of water extraction unit.



Model of apparatus developed for theoretical analysis

Multi-robot search of an area by a team of (potentially heterogeneous) platforms, by leveraging the different capabilities of the robots.

Research Internship at National University of Singapore (NUS) at MARMOT Laboratory

Student: Atul Dhamija

Duration: Oct 2021 - Present

Guide: Dr. Guillaume Sartoretti

He has worked under the supervision of Dr Guillaume Sartoretti in the field of "Collision-Free Multi-Agent Path Finding for 2D/3D Robots". Generalizing the model for more than 128 robots working in a factory environment.He Implemented Reinforcement learning methods to solve Multi-Agent Path Finding problems.

Weld Detection using computer vision

Summer internship at IIT Kharagpur, Nainital

Student: Janvita Reddy

Duration: May 2021 - Dec 2021

Guide: Professor S. K. Pal

Welding automation uses robots to increase the performance of the production of welds. This automated welding process increases the speed, precision , quality and also minimses the chances of errors or inconsistent welds compared to manual welding.

Development of Computationally Efficient Stochastic Research Model

Indian Institute of Technology, Delhi, Research Fellow

Duration: January 2021 - April 2021

Student: Jackson Chauhan

Guide: Professor P. V. Shubharao

The research topic of the internship was Development of Computationally Efficient Stochastic Research Model (SRM) for RCCI Engine and Experimental Validation, focusing on detecting a perfect combination of fuel and engine dimension to minimise the production of NOx during combustion and maximize the efficiency of the engine.

3D Printing

Indian Institute of Technology, Varanasi, Research Fellow

Student: Jackson Chauhan

Duration: May 2021 - July 2021

Guide: Dr. Santosh Kumar
The aim is to learn various 3D printing techniques and different kinds of materials used for the same. The study was based on printing polymers and it's composites with fibres, particles and nano-particles

Numerical Solution of Fluid Flow Problems

Student: Devansh Shah
Duration: May 2021 - September 2021
Guide: Dr. Rajendra Vedula
He did his internship on the numerical solution of fluid flow problems using OpenFoam software

Implementation of Physics-Informed Neural Networks to Solve Boltzmann Equation with BGK

Summer Research Internship, Indian Institute of Technology, Kanpur, India
Duration: May 2021 - July 2021
Student: Rutuja Jadhav

Design and development of an innovative and cheap cotton harvester for farmers owing small lands

Indian Institute of Technology, Madras, India
Duration: June 2021 - July 2021
Student: Rutuja Jadhav

Kirigami base Soft Robotic Gripping Mechanisms

Indian Institute of Technology, Kharagpur
Duration: May 2021 - July 2021
Student: Rutuja Jadhav

Structural and thermal analysis of the antennae for Mission Pratush Satelite launched by ISRO

Internship at Raman Research Institute
Student: Rutuja Jadhav

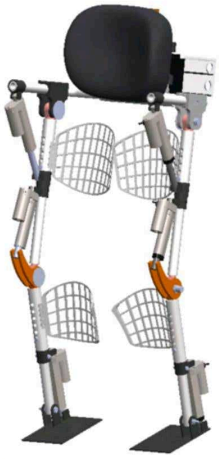
Detection of the Sigmoid in X-ray wavelength using Deep Learning

Arya Bhatta Institute of Observational Sciences. Nainital
Duration: May 2021 - Dec 2021
Student: Rutuja Jadhav

STUDENT'S ACHIEVEMENTS

GUJCOST WINNERS

A Multi-articulating Prosthetic Arm with Myo-electric Control was developed by a team of students namely Mihir Chanpura, Sanket Kathrotiya, Dixit Patoliya, Vasim Khatri and Charles Vanpariya under the mentorship of Dr. Harshit K. Dave, Associate Professor, DME. The shape of fingers is similar to actual human fingers. Each finger is designed in such a way that despite having only two joints, it can perform basic tasks like holding or picking an object. Like an actual human thumb, the thumb of the prosthetic arm has two degrees of freedom and two joints. The wrist of the prosthetic arm is capable of performing flexion and extension like an actual human wrist. An ergonomic mounting unit for the hand of an amputee is designed in such a way that the amputee can wear the prosthetic arm using one hand. Prosthetic arm can be controlled wirelessly using mobile app so remote applications are also possible. It can also be used by a worker to hold equipment or anything in a hazardous environment while maintaining a safe distance. Furthermore, it can also be used for covid-19 testing while taking test samples from a patient. The working prototype won first prize of Rs. 5,00,000/- at GUJCOST – Robofest – I competition and received the certificates and cash prize from Chief Minister of Gujarat.



Param Bhavsar, Manan Gohil, Harsh Kakadiya, Pratik Patel(GMC,Surat) and Sunny Bagde manufactured model shown in the figure under the guidance of Dr. Harshit Dave. This project was funded by GUJCOST Robofest 2.0 under the category of 'Powered Exoskeleton'. It has reached the final round of the competition with receiving 2.5 Lakhs INR funds for prototyping the model in the first two rounds. The result of the final round is yet to be announced. This model also recieved a design patent with reference to our project .

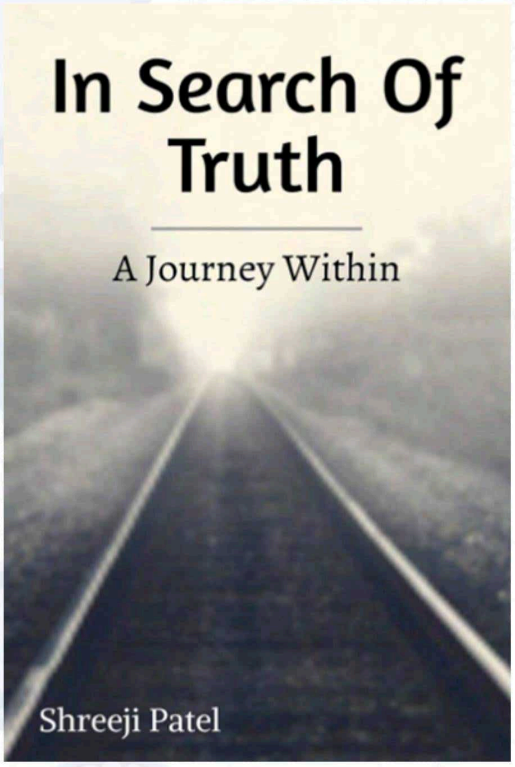
EXTRA-CURRICULAR ACTIVITIES

Gold Medalist in Inter NIT Swimming - Aman Vyas

Aman Vyas, a 3rd-year Mechanical Engineering student set a record for SVNIT by winning 5 medals at All India Inter NIT Swimming Competition organised by NIT Suratkhal in Januray 2020. The five podium finishes came in the following categories:

- Gold Medal - 100 m butterfly
- Gold Medal - 400 m individual medley
- Silver Medal - 50 m butterfly
- Silver Medal - 100 m freestyle
- Bronze Medal - 100 m backstroke

A Young Budding Writer - Shreeji Patel



Shreeji Patel, a 3rd-year student from the Mechanical Engineering Department published a self-help book at such an young age. In the book titled "In Search of Truth". He has tried to summarise his experiences from his studies of Shrimad Bhagwat Gita, Ramayan and Shrimad Bhagwatam in a concise yet profound form. His prime objective was to enrich the readers with motivation and righteousness in order to become a true gem to society and eventually mankind. "Everyone is in the pursuit of making life better, but this is not a permanent solution. For the permanent solution of these material bonds, one has to think outside the box", Shreeji said. He elaborates how the outside world is still crippled with high levels of depression and frustration for material goods.

First in Video Making

Makwana Vaibhav Rameshbhai, Rathod Chinmaykumar Pravinkumar, Dhvani Jatin Gemlawala, Prajapati Ashish Shaileshbhai and Shreeji Shaileshkumar Patel participated in a team in a Video Making Competition organized by Unnat Bharat Abhiyan (UBA) India. This video-making competition aims to create repository and awareness material in regional languages/dialects for circulation among the village clusters for COVID-19 Awareness.

The team secured 1st rank out of 52 videos submitted by different institutes all over Gujarat. And also received prize money of Rs.10,000/-.

Tutor on Udemy - Mandaliya Yash

Student of 3rd-year Mechanical Engineering Department created a Udemy course on advanced modelling software Solidworks which was released in October 2021. The course consists of real-life exxamples and can be taken by a beginner too. This course was made free for the first 100 students so that a majority of SVNIT students can benefit from it.

Yash Paresh Bhardava

Yash Bhardava recieved 3rd Prize in Monosketch Competition organized by Cultural Council, IIT BHU. The competition required participants to use one of the techniques among scribbling, hatching or stippling to make an artwork on theme “refelctions”. The image to the right shows his submission for the competition which was made entirely using the technique of scribbling using a single ball point pen. It showcases that each one of us has immense potential within.

Rotaract Club of Udhana

The Rotaract Club of Udhana was started with an initiative to reach out and help as many people as possible. After the installation in June 2021, the club successfully conducted various projects like Aahar(Food Donation), Kitabein(Book Donation), and Paridhan Pradan(Clothes Donation). Several board members of the club are students of Department of Mechanical Engineering, SVNIT, Dhvani Gemlawala(Secretary), Lenin Agrawal(Vice President), and Shruti Goyal(Finance Committee Director).

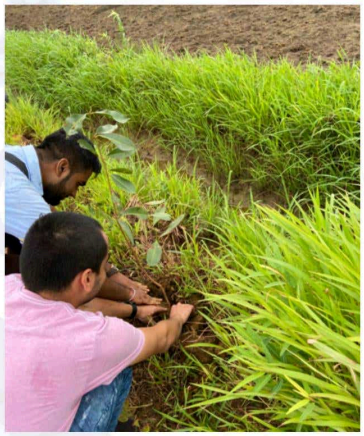
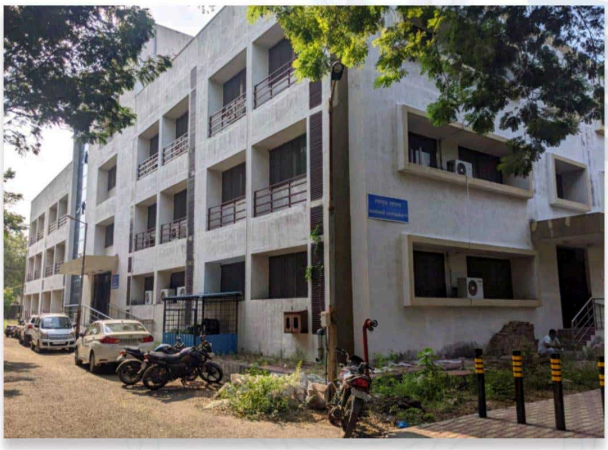


PHOTO GALLERY

Advance Manufacturing Laboratory

Engine Test Setup (Computerised)

Coordinate Measuring Machine

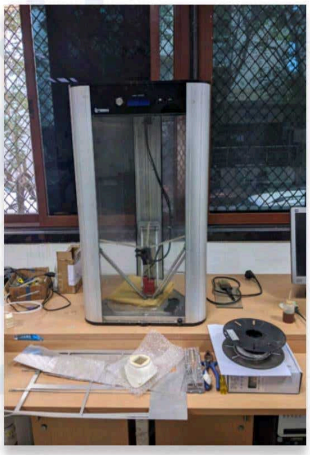


Production Section

Automobile Radiator Test rig

Thermosyphon (Heat Pump)

Wave flume



3-D Printer (FDM)

Workshop

Gas Metal Arc Welding Machine

Centrifugal Pump Test Rig

Cascade Refrigeration System

Electro Discharge Machining (EDM)

Close loop Pulsuating Heat Pipe

CNC Turning Centre

Lab Scale Srew Extruder

Thermal Dispersion Test Setup

Comprehensive Mechatronics Training System

CNC Machining Centre

Plasma Transferred Arc Welding Machine

Department of Mechanical Engineering
Sardar Vallabhbhai National Institute of Technology, Surat