

APRIL - JUNE 2021

MECH @ CONNECT



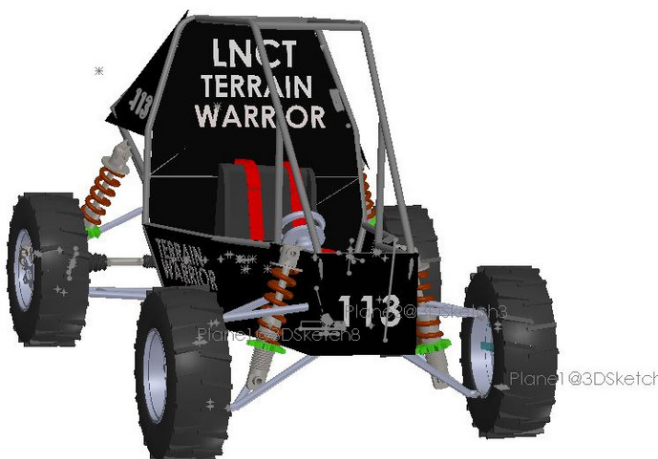
Updates of the Mechanical Department



OVERVIEW:

Terrain Warrior unveils BAJA 21'

This time Students of LNCT SAE CLUB developed the whole ATV virtually, named TERRAIN WARRIOR 2.0. The team participated in *SAEINDIA BAJA - 2021* and were among the Top 15 Design Finalists. Team group photo also got featured in *AutoCar India* magazine, edition - June 2021.



- College organizes a 'online essay writing competition'
- Few students qualify GATE & CAT.
- The T20 World Cup will be moved to UAE from India.
- MORAI's autonomous vehicle (AV) simulation launched.

The Newsletter of Mechanical Engineering Department is a regularly distributed publication that is generally about the event, programs and achievements of the Department and news related to Mechanical Engineering.

**LAKSHMI NARAIN COLLEGE OF
TECHNOLOGY, BHOPAL**
VISION

To be a premier institute where engineering education and research converge to produce engineers as responsible citizens.

MISSION

- To improve continually in the teaching-learning process by strengthening infrastructural facilities and faculty credentials.
- To undertake interdisciplinary research and development by engaging the faculty and students in curricular, co-curricular and industry collaborated projects towards problem solving.
- To enhance proportion of skilled based courses beyond curriculum to create more employable graduates.
- To inculcate human values, ethics, patriotism and responsibility in our outgoing engineers by providing conducive environment.

**DEPARTMENT OF MECHANICAL
ENGINEERING**
VISION

To be recognized in academics and research for producing engineers as responsible citizen who are innovative, choice of employers and able to do further studies & research.

MISSION

- To provide knowledge and skills of Mechanical Engineering to the students.
- To impart quality education to make students competent mechanical engineer and responsible citizen.
- To provide facilities and environment conducive to grounding scholars for employability, higher studies and research.
- To prepare its students for successful career in engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- To make the students able of applying knowledge of mathematics, science and subjects of mechanical engineering in dealing with engineering problems.
- To be able to identify and understand real life problems and suitably design and manufacture, feasible and sustainable mechanical devices and systems.
- To be able to carry out the research work in the field of Mechanical Engineering.
- To be able to use modern tools and techniques for the efficient working and meeting challenges of modern society and industry.

News Highlights

- ON THE OCCASION OF INTERNATIONAL BIODIVERSITY DAY COLLEGE ORGANIZES AN 'ONLINE ESSAY WRITING COMPETITION'
- MOST OF THE STUDENTS FROM OUR DEPARTMENT GOT PLACED IN CORE
- TWO OF 2021 GRADUATES HAVE STARTED THEIR JOURNEY IN IIT AND IIM RESPECTIVELY.
- NEW PROPULSION SYSTEM COULD ENABLE FLYING AT SPEEDS UP TO MACH 17
- MORE COMPACT AND EFFICIENT VERTICAL TURBINES COULD BE THE FUTURE FOR WIND FARMS.
- BIOENERGY WILL PLAY A VITAL PART IN THE FUTURE ENERGY MIX – HERE'S WHY
- NEW ZEALAND DEFEATED INDIA TO WON THE 1ST ICC WORLD TEST CHAMPIONSHIP
- SAE LNCT CLUB SHINES IN BAJA 21' IN THE MIDST OF PANDEMIC.
- MORAI'S AUTONOMOUS VEHICLE (AV) SIMULATION LAUNCHED

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Campus News



- On the occasion of **INTERNATIONAL BIODIVERSITY DAY 2021** as seen on **May 22** our college organizes an 'online essay writing competition'. The theme of this year is *we are part of the solution #ForNature* & the topic is '**importance of biodiversity conservation**'.
- On **5 th June** we take an oath on the occasion of '**World Environment Day**' as a human, an engineer to control and reduce the pollution.
- We had a discussion over it on different aspects of pollution and solution to get rid of it.
- "Progress is impossible without change, and those who cannot change their minds cannot change anything."



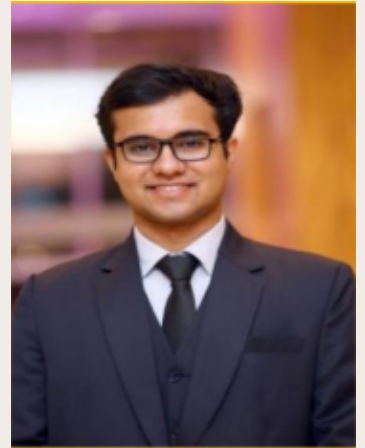
- PLACEMENT NEWS :-**
70 students of our department got placed holding good packages, Out of which **20 of them** are got their job offer from 'Core Mechanical Firms'. While a few of our students have MULTIPLE offers from various firms to join, like WIPRO , COGNIZANT, TCS, etc.

Campus News

PRIDE MOMENTS

We as a department are very pleased to have such a wonderful team of faculty, alumni and students and they always make us feel proud by their achievements.

- **Mr. Akshat Kapoor & Mr. Rhandir Kumar** are such a pride for our department as they made a good choice and determined about it till, they make their way to accomplish it.
- **Mr. Akshat Kapoor** who is recently graduated in 2021 qualified **CAT (Common Aptitude Test)** with a score of **99.32 percentile.**
- He is now part of IIM (Indian Institute of Management) Lucknow. He believes that being consistent during his preparations lead him to success and the guidance by the mentors is one of the key points behind this achievement.



Mr. Akshat Kapoor

- He has a dream to work with **MOTORSPORT ORGANIZATION.**
- About his IIM life he says that in spite of busy schedule he loves the culture of IIM of leaving a paced, exciting and challenging life.
- About his LNCT life he thanked his friends, faculty, department and the various clubs he was part of '**AAROH**' the racing team' (started by him), '**RAHAT**' and a few more.
- His advice to juniors that go and explore each and every thing you can and optimize your potential and limits.

"Make the best out of all the opportunities that comes in your way."

Campus News

PRIDE MOMENTS

- **Mr. Randhir Kumar** who is also graduated recently in 2021 and qualified **GATE (graduate aptitude test in engineering)** and score a rank **AIR 164**.
- He is now a part of **IIT** (Indian Institute of Technology) Bombay doing **MTech in Mechanical Design**. His main aim is to get into one of the PSUs and to work in the field of design.
- About his IIT life he says that in spite of busy schedule he loves the culture of IIT of leaving a paced, exciting and challenging life and he is ok with that in fact he feels good about it.
- He believes in Hard Work and said if you do hard work you can access the way to do Smart Work.



Mr. Randhir Kumar

"Hard work is the backbone of smart work."

RESEARCH WORK AND PUBLICATION'S

Dr. YOGESH DEWANG one of the professors of our department is very fascinated about the new inventions, researches and their various aspects about the engineering fields in different domain.

So, over the time as a result, he developed a very interesting prospectus of his own research articles. A Review on Scramjet Engine: Advances in fluid and thermal Engineering o Effect of Process.

Parameters on **Thermo-mechanical Behavior of Direct Extrusion of Aluminum Alloy**: Iranian journal of Material science and engineering o Strategies for Reduction of Harmful Emission from Diesel Engines: published in IOP Conference Series: Earth and Environmental Sciences o Friction stir processing of hybrid Al-Si alloy metal composite.



Dr. Yogesh Dewang

News Around World

NEW PROPULSION SYSTEM COULD ENABLE FLYING AT SPEEDS UP TO MACH 17

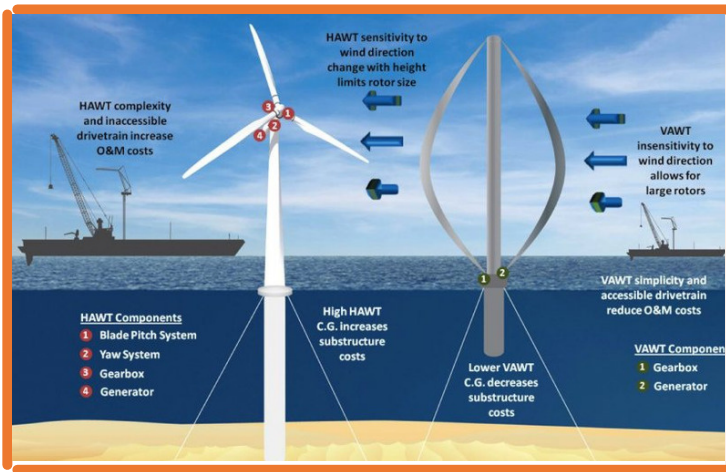
- In a recent research by *University of Central Florida*, published in the journal *Proceedings of the National Academy of Sciences*, the researchers discovered a way to stabilize the detonation needed for **hypersonic propulsion** by creating a special hypersonic reaction chamber for **jet engines**.
- The system could allow for air travel at speeds of Mach 6 to 17, which is more than **4,600 to 13,000 miles per hour**. The technology harnesses the power of an oblique detonation wave, which they formed by using an angled ramp inside the reaction chamber to create a detonation-inducing shock wave for propulsion.
- Unlike rotating detonation waves that spin, oblique detonation waves are stationary and stabilized.
- The technology improves jet propulsion engine efficiency so that more power is generated while using **less fuel** than traditional propulsion engines, thus lightening the fuel load and **reducing costs and emissions**.
- In addition to faster air travel, the technology could also be used in rockets for space missions to make them lighter by requiring less fuel, travel farther and burn more cleanly.



Detonation-based hypersonic propulsion could be implemented into human atmospheric and space travel in the coming decades, the researchers say.

News Around World

MORE COMPACT AND EFFICIENT VERTICAL TURBINES COULD BE THE FUTURE FOR WIND FARMS.



- New research from *Oxford Brookes University* has found that the **vertical turbine** design is far more efficient than traditional turbines in large-scale wind farms, and when set in pairs the vertical turbines increase each other's performance by up to 15%.

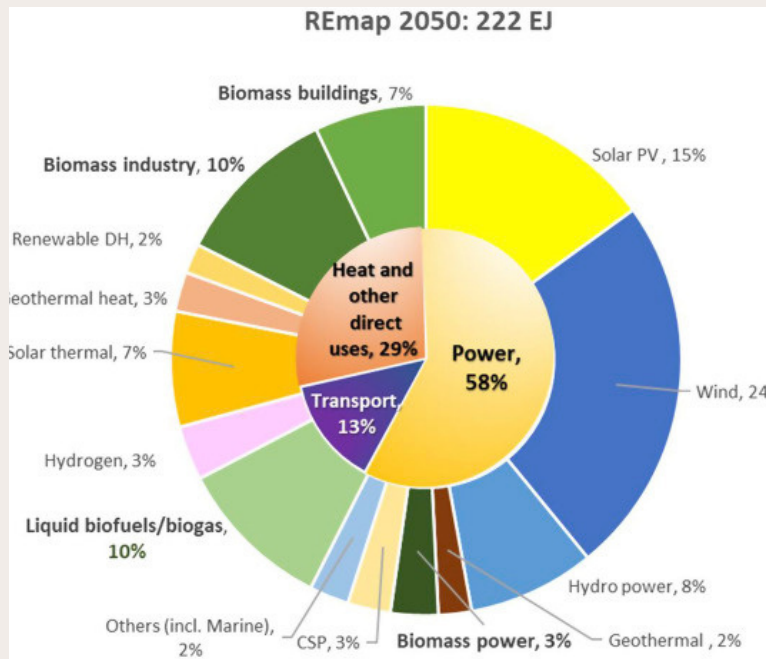
- A research team from the School of Engineering, Computing and Mathematics (ECM) at Oxford Brookes led by Professor Iakovos Tzanakis conducted an in-depth study using more than 11,500 hours of computer simulation to show that wind farms can perform more efficiently by substituting the traditional propeller-type **Horizontal Axis Wind Turbines** (HAWTs), for compact **Vertical Axis Wind Turbines** (VAWTs).
- The research demonstrates for the first time at a realistic scale, the potential of large-scale VAWTs to outcompete current HAWT wind farm turbines.
- VAWTs spin around an axis vertical to the ground, and they exhibit the opposite behavior of the well-known propeller design (HAWTs). The research found that VAWTs increase each other's performance when arranged in grid formations. Positioning wind turbines to **maximize outputs** is critical to the design of wind farms.
- The study is the first to comprehensively analyze many aspects of wind turbine performance, with regards to array angle, direction of rotation, turbine spacing, and number of rotors. It is also the first research to investigate whether the performance improvements hold true for three VAWT turbines set in a series.

Reference: "Stabilized detonation for hypersonic propulsion" by Daniel A. Rosato, Mason Thornton, Jonathan Sosa, Christian Bachman, Gabriel B. Goodwin and Kareem A. Ahmed, 10 May 2021, Proceedings of the National Academy of Sciences

Industrial Expert Talk

BIOENERGY WILL PLAY A VITAL PART IN THE FUTURE ENERGY MIX – HERE'S WHY

The role of bioenergy in a decarbonized energy system is often poorly understood.



Bioenergy is not just another source of renewable energy, it can also provide **storage, carbon capture and frequency stability**. This unique combination of capabilities will make it a critical component of the future decarbonized energy mix. Bioenergy will allow a very significant amount of buffering between supply and demand. Wind and solar are intermittent, while bioenergy can provide

power when it is needed, allowing seasonal variations in energy supply and demand to be matched.

Dispatchable bioenergy

Dispatchable generation can be turned on and off in response to demand for electricity. Daily fluctuations and mismatch in supply and demand are likely to be resolved through a combination of **smart charging** and devices providing demand-side response, and grid energy storage using batteries and pumped-storage hydroelectricity.

Negative emissions without carbon capture

As trees grow, they capture carbon from the atmosphere, eventually releasing it back into the atmosphere owing to decomposition and fires. Traditionally, it was thought that mature forests reach an equilibrium, releasing as much carbon as they capture. It is now known that even ancient **primary forests** continue to **capture more carbon** than they release, with some carbon accumulating in soil.

Biomass can support reforestation and afforestation of land, which the **Intergovernmental Panel on Climate Change** (IPCC) estimates could capture 0.5 to 3.6Gt of CO₂ annually

Industrial Expert Talk

BIOENERGY WILL PLAY A VITAL PART IN THE FUTURE ENERGY MIX – HERE'S WHY

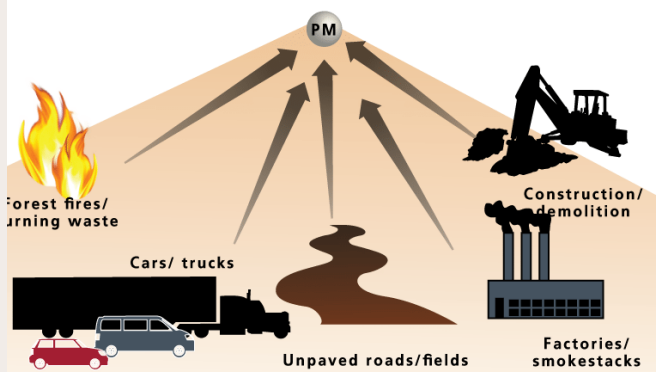
Particulate pollution

The toxicity of particulates from biomass is likely to be similar to those from fossil fuels.

Technologies are available to reduce the emissions from both coal and biomass-fired power stations.

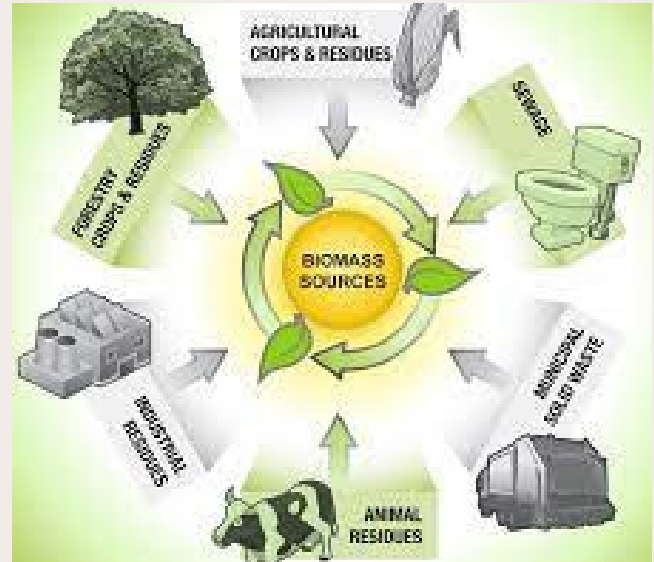
PRIMARY PARTICULATE MATTER

emitted directly from a source into the atmosphere.



To ensure that devices function correctly, the AC frequency and phase must be synchronised across the entire national grid. Frequency response can be achieved by turning generators on and off. The control becomes much easier, however, if the rate of changes is damped out by having large generators with significant inertia rotating within the system. Biomass can provide this inertia to support frequency stability in the grid.

The future of bioenergy



Unusually for a renewable energy source, bioenergy can provide both dispatchable power and inertia. Perhaps uniquely, it can also enable carbon capture and storage. These properties will make it a vital component of a decarbonised energy system.

Bioenergy can, however, only play a niche role in decarbonization. There isn't enough land to generate all of our energy from biomass, and this would have a huge impact on both air quality and ecology. So, bioenergy should be seen as an important last resort to be used when needed to provide dispatchable power, inertia and offsetting of non-energy emissions.

Source :- <https://www.imeche.org/news/news-article/feature-bioenergy-will-play-a-vital-part-in-the-future-energy-mix-here-s-why>

Sports News

National/International

1. Due to COVID-19, the Cricket Control Board has suspended the **Indian Premier League** (IPL) indefinitely. The decision was made after Balaji tested positive for COVID-19. Balaji is the bowling coach of CSK. So far, 29 games have been played.



The T20 World Cup will be moved to **UAE** from India. This is mainly because if it is held in India, due to the country's **2nd Wave of Corona virus**.

2. Indian Women created history at the **AIBA Youth World Boxing Championship 2021**. A complete of **eight Indians** entered the **finals**. Of this, seven have been women. All the female finalists finished on top.

3. **Rafael Nadal won** the 2021 Italian Open. This is his **tenth Rome Masters** championship. On May 16, 2021, the Italian Open was held in Rome. The final was held between Rafael Nadal and Novak Djokovic. It is also called the Rome Masters.

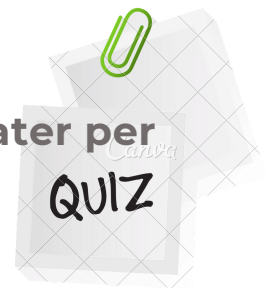


4. **New Zealand** defeated India to **won** the 1st ICC World Test Championship. New Zealand chased down the goal of 139 to win the first-ever **World Test Championship final** with eight wickets in hand. Highlights: The final day of the in shape used to be performed on June 23, 2021. The fit saw 6 days play in region

of the normal 5 days due to the rain.

5. Mahindra Racing can now reveal its brand new **#DrivenByDesign** competition that will see fans have the opportunity to design the race suits of Alexander Sims and Alex Lynn for the London E-Prix.

Check Your Knowledge



1. Hyperbolic Cooling tower cools _ _ _ _ _ gallons of water per minutes

- (A) 48000 gallons of water per min
- (B) 480 gallons of water per min
- (C) 480000 gallons of water per min
- (D) 48000 gallons of water per

2. In Lead Acid Batteries Electrolyte used is

- (A) H_2SO_4
- (B) Diluted Sulphuric Acid
- (C) Sulphuric Acid
- (D) Concentrated Sulphuric Acid

3. HPPS stands for

- (A) Hybrid pneumatic power system
- (B) High Performance Particle Size
- (C) Heat Pump Pool Solutions
- (D) None of the above

4. In Thermoelectric generator which of the following material is used

- (A) Dielectric Material
- (B) Non conducting material
- (C) Semi-conducting material
- (D) None of the above

5. FAME II scheme is came into force from

- (A) May 1, 2019
- (B) April 1, 2018
- (C) February 1, 2019
- (D) April 1, 2019

6. When did Indian government unveiled "National Electric Mobility Mission Plan (NEMMP) "to make a major shift to electric vehicles.

- (A) 2012
- (B) 2008
- (C) 2002
- (D) 2013

Answer

1.(C) 2.(B) 3.(A) 4.(C) 5.(D) 6.(D)

LNCT SAE CLUB

SAE LNCT is an endeavour of passionate and dedicated students at one of the premier institutions of Central India that works to develop off road and formula racing vehicles. The aim is not only to develop conventional and non-conventional racing vehicle, but also to delve into the details- to appreciate the science behind it and innovate.

SAE ATV Team stood in BAJA SAEINDIA 2021

- Among the top 15 engineering Design finalists.
- Our team photo was published on AutoCar India magazine.

BAJA SAE INDIA- Society of Automotive Engineers

challenges engineering students to design and build their passion while an off-road vehicle that will

survive the severe punishment of rough terrain and in some competitions, water. As in



real work situations, these future engineers work together as a team to discover and resolve technical challenges in *design, test, and manufacturing*, as well as *business issues* in their

ATV - All Terrain Vehicle

The most rugged of all the competitions, Baja SAE also gives students the first-hand challenge of pursuing their passion while managing real-life

demands and priorities. In accordance to become a part of SAE International few dedicated students of

our institute put the first brick years back and with their head and heart and endeavors effort we (our team) make a remarkable journey and throughout the years we got the chance to taste the flavors of all the events organized in all over India. The team was established as a student-run organization in 2013.

Team 'TERRAIN WARRIOR 2.0' was led by **Riyan C Jose & Amitesh Prasad as Captain and Vice-captain** respectively. With the help of strong and stable support system and dedication of team members to optimize their relevant fields.



WE HOPE THE BEST FOR THE COLLEGE AND THE CLUB

Articles

MORAI'S AUTONOMOUS VEHICLE (AV) SIMULATION

- **MORAI Inc. is a South Korean start-up** building simulation tools and solutions for autonomous vehicles and autonomous systems. Providing engineers with detailed photorealistic scenes such as complex city intersections and test racetracks, MORAI's simulation environments help customers perform verification and validation for their autonomous vehicles.



- MORAI's autonomous vehicle (AV) **simulation solution**, by recreating roads, sensors, and even vehicles within a virtual 3D simulation environment, allows users to freely test how their algorithms and software will react to difficult or dangerous scenarios without risk to drivers or other vehicles. Simulation also grants full control of the scene to the test operator, enabling tests for drastic, diverse weather conditions and edge cases not commonly seen while driving.

- One of the features to be highlighted at CES 2021 is data-based scenario creation, where **pre-recorded traffic** data for a specific region can be used to recreate a test scenario identical to the recorded data. Instead of relying on the user to create test cases manually, **real-world data** can be used directly to enhance scenario realism and accuracy.
- Real-world data is also key to building MORAI's simulation environments, which are digital twins of specific regions of interest, based on a combination of detailed geospatial map data and satellite imagery. Simulation environments can range from single city blocks or small highway segments to entire city districts.

Articles

MORAI'S AUTONOMOUS VEHICLE (AV) SIMULATION

- MORAI's continued development of its core technologies and AV simulator helped the company raise around **\$2 million** in Series A funding last November. Now, MORAI plans to grow its network of over 50 different partners and clients internationally.
- "Last year's CES was a valuable experience that helped to introduce our products and technology to a global audience," said Jiwon Jung, co-founder and CEO. "We hope that during CES 2021, we can show how much MORAI's core simulation has matured and connect with leaders within not just the AV industry, but from the automotive and tech industries as well."

For more information, web reference- <https://www.morai.ai>

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