



Our Patrons : Pimpri Chinchwad Education Trust

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Samvaad Editorial : Thermal Management

Since last few decades, efficient design of mobile air conditioning system (AC) has been the core of attention for most of the automotive manufacturers and academic researchers. Two crucial targets for the auto industries are reduction in tailpipe emissions and fuel consumption.

Vehicle fuel consumption and emission have been critically impacted by its mobile air conditioning system i.e. utilization of AC can increase NOx emission from 15% to 100%. The cooling power consumption of a mid-sized vehicle is 12% higher than total vehicle power during run.

HVAC is a critical system for Hybrid Electric Vehicle (HEV) as it is the second most energy consuming system after electric motor. Major influencing parameters are air temperature, air velocity, relative humidity, mean radiant temperature, clothing insulation and metabolic rate.

A pre-requisite for efficient design of mobile AC system is estimating heating and cooling loads encountered by the passenger cabin. AC system maintains the passenger comfort within the pre specified thermal comfort zone by compensating for continuous changes that occurs in cabin load.

By controlling climate of cabin load have larger impact on Hybrid Electric Vehicle performance. HEV have 22% lower fuel economy with the AC. Cooling of vehicle cabin can take maximum of energy available in the battery, remarkable reduction in vehicle efficiency.

According to advance Powertrain Research Facility at Argonne National Laboratory, has reported that 59.3% and 53.7% diminished in maximum heating and maximum cooling range respectively for the city driving condition.

For EVD's compared to IC engine driven vehicles, climate control impact directly on parts or components such as batteries, power electronics and electric machines. The cooling of these components require additional energy of battery which turns out to be waste of energy for this purpose.

“Thermal Comfort” is defined by American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) as “the state of mind that expresses satisfaction with the surrounding environment”

One of the most significant, popular and internationally accepted indices is the Predicted Mean Vote (PMV) which is applied in analysis of present day vehicles.



Dr. Pravin R. Kale
Dean, Student Development & Welfare

With development in automobile, particularly in the field of electric vehicles (green cars) the heat dissipation is increasing at a rapid rate and therefore thermal management is becoming predominant.

Climate control is actually redesigned mobile air conditioning system that is designated as “smart air conditioning system”. Which means no matter whatever is the temperature outside, the interior

cabin temperature will be maintained at the desired set level. Heat balance method (HBM) used for evaluation the heating and cooling loads for hybrid electric vehicle cabin.

Thermal comfort indices i.e. Predicted Mean Vote (PMV) and Predicted Percentage Dissatisfied (PPD) are calculated. Heat transfer analysis includes a compressive set of thermal design and effects of resistive heat load. COMSOL enables the interpretation of results considering the multiphysics domain approach which assist to examine the real world behaviour of thermodynamic systems.

*** Team Samvaad ***

Editor-in-Chief : Dr. Govind N. Kulkarni

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Samvaad Scientific Break Through: A Novel Photocatalytic Material for Future Hydrogen Fuel Based Transport

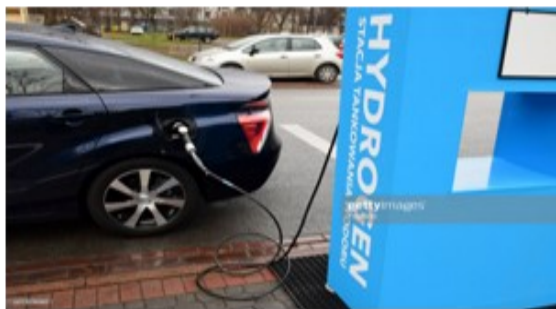
World is looking forward to shift from highly polluting and non-renewable fossil fuels to the clean and renewable energy resources. In this view, hydrogen gas can be considered as a potential resource.

Current hydrogen production approaches focus on photocatalytic reactions, thereby utilizing the semiconductors. Titanium oxide (TiO₂) is highly investigated semiconductor material and has band gap around 3.2 to 3.35 eV. It exhibits photocatalytic properties as its band position lies close to the redox potentials of water splitting.

Though, it is low cost and non-toxic materials, it presents some limitations. Being a wide band gap (3.2 to 3.35 eV) material, only 5% of the UV radiations out of the incident solar spectrum could be absorbed, which reduces the efficiency of the conversion.

To improve the conversion efficiency, one needs to look for modifications in the electronic structure of the utilized semiconductor, so that most of the light from the visible region of the solar spectrum will be absorbed. Kwon and his researcher team [1] of ETH Zurich Switzerland, discovered a novel approach to improve the efficiency of the hydrogen production.

Team utilized doping palladium nanoparticles and Nitrogen doping in monolithic TiO₂ aerogels. This approach helped them to modify the electronic structure of TiO₂ making it suitable for absorption of more light in visible region. Aerogels consist of around 99% air and 1% solid. They utilized plasma enhanced chemical vapour de-



Dr. M.B.Kadam
Assistant Professor, AS&H, PCCoE, Pune

-osition technique to synthesize N-Pd-TiO₂ aerogels in three dimensional form.

Authors claimed that already various ways have been utilized by different research groups to incorporate Nitrogen into TiO₂ nanostructures, however activation of TiO₂ aerogels with nanoparticles and Nitrogen while keeping the porous structure of the aerogels intact has not been reported yet. Aerogels are the lightest materials. In general, these materials consist of around 99% air and 1% solid. They utilized plasma enhanced chemical vapour deposition technique to synthesize N-Pd-TiO₂ aerogels in three dimensional form.

The optical properties of synthesized aerogels were found to be modified significantly which was attributed to Nitrogen 2 p state excitations to conduction bands.

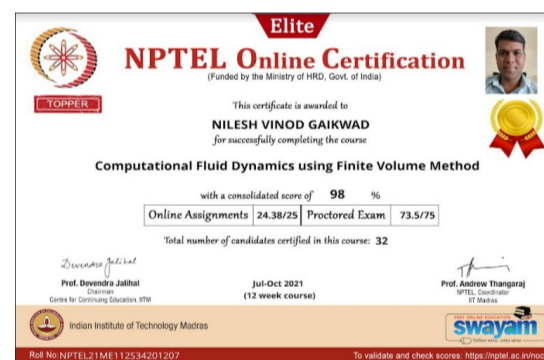
Material was further investigated for hydrogen production when exposed to visible light revealed its suitability for photocatalytic hydrogen production from water as well as methanol.

The beauty of this material doping of nitrogen in Pd- TiO₂ aerogels produces 70 times more quantity of the hydrogen than Pd-TiO₂ without affecting much to its stability. This milestone in hydrogen production technology and will bring a boom in hydrogen fuel based transport in near future.

More details are available in their open access article [1]: Kwon et al. ACS Applied Materials & Interfaces 2021 13 (45), 53691-53701, DOI: 10.1021/acsmi.1c12579.

Faculty Achievements

1. Prof. R.T. Jagtap Received "Best Student Development and Welfare Officer" award from SPPU for the year 2019-20. This award is for effective implementation of student development activities in College. Prof Jagtap received this award by the hands of Honorable VC Dr. Nitin Karmalkar.
2. Mr. Nilesh V. Gaikwad awarded NPTEL online certification to complete the course " Computational fluid Dynamics using Finite Volume Method" with 98%.
3. Dr. Rachana Patil was invited talk on "Perimeter Forensic Investigation can be Penetrated to Unmask the True Origin of Cyber Crime" in International 3rd Global Forensic Science Conference Conducted in 19th -21st November, 2021.



Students Achievements

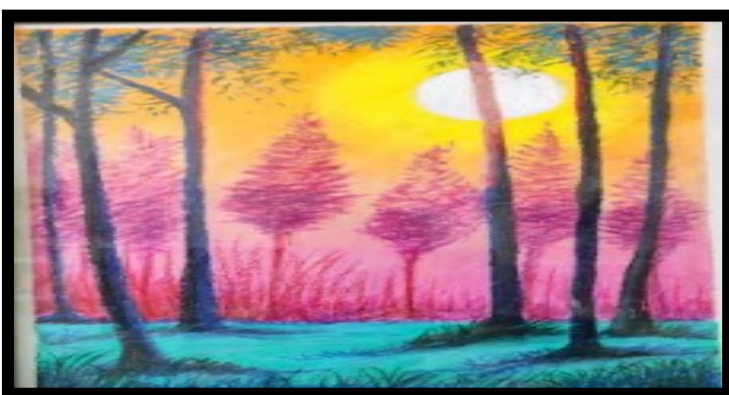
Team Ashnoor— Rutuja Nemane, Shreya Pillai, Nupur Shiturkar, Anjitha Nair	Winner of ACM-W India National Level Virtual Hackathon 2021 —organized by MUJ ACM Student chapter at Manipal university based on the theme "Innovating with Technology" Dr. Anuradha Thakare is the faculty coordinator.
Ms. Tanaya Saptashwa	Won the Inter college Rope Mallakhamb Competition.
Prathmesh Gurav, Shrutam Challani, Pratham Agarwal, Isha Mali	3rd Rank in Dome Building competition organised by DIT ASCE International student chapter of Dr. D. Y. Patil Institute of Technology, Pimpri, Pune held from 1st Nov. 2021 to 18th Nov. 2021. Mr. Swapnil Kurhade and Mrs. K. D. Dhapekar are the faculty coordinators.
Akshay Munot , Eshha Mohod, Harshit Khandelwal, Sheyash Wetal	Received 2nd Prize of Rs. 10,000/- in All India National Level Technology Dissemination contest for Students (TDCS 2021)/ Eureka 2021) Track-1:Technologies for Environment , Climate Change & Natural Disasters.
Tejal Gandhi, Iqra Khan, Kartik Jadhav, Yash Tembhurnikar	Received 2nd Prize of Rs. 10,000/- in All India National Level Technology Dissemination contest for Students (TDCS 2021)/ Eureka 2021).Track-2:Medical Technologies for Health and Wellbeing,
Khushi Desrada , Darshan Kasar, Pranav Mahajan, Mahdur Kharche	Received 3rd Prize of Rs. 5,000/- in All India National Level Technology Dissemination contest for Students (TDCS 2021)/ Eureka 2021) Track-1:Technologies for Environment , Climate Change & Natural Disasters. .
Eshaa Mohod	Most Active Volunteer Award 1st Prize Received Rs. 1500/-
Akshay Munot	Most Active Volunteer Award 2nd Prize Received Rs. 1000/-



PCCoE Technical Feast

1. Dr. U. G. Potdar (PI) and Dr. N. R. Deore (Co-PI) of Mechanical Engineering department received grant of Rs 24,83,840- from Science and Engineering Research Board, Department of Science and Technology, Government of India for "Design and Development of Miniature Liquid Fuel Film Combustor Thermoelectric Power Generation".
2. Mrs. Savita Kumbhare published a research paper on "Federated Approach for Privacy-Preserving Traffic Prediction Using Graph Convolutional Network" J. Shanghai Jiaotong Univ. (Sci.) (2021) <https://doi.org/10.1007/s12204-021-2382-5>
3. Sanket Chaudhari, K. Rajeswari, Sushma Vispute published a research paper on "A Review on using Long-Short Term Memory for Prediction of Stock Price" in international Journal of Engineering Research and Technology (IJERT) Volume 10, Issue 11 (November 2021),ISSN: 2278-0181
4. Atharv Deshmukh, Aditi Thakre, Unnati Bhalekar, Hrishikesh Badakh, Manjiri Ranjanikar published a research paper on " in the Journal of Aegaeum (AJ); Volume 9, Issue 11, Page: 151-158 DOI:16.10089.AJ.2021.V9I11.285311.4528.
5. Bhargavi Jahagirdar, Divya Munot, Niranjana Belhekar, K. Rajeswari, published a research paper on "Identification of Indian Medicinal Leaves using Convolutional Neural Networks" in the International Research Journal of Engineering and Technology (IRJET) Volume 8, Issue 11, November 2021 S.No: 246 ISSN: 2278-0181
6. Rahul Patil, Kanase S., Bhegade N., Chavan V., Kashetwar S. published a research paper on "System for Analyzing Crime News by Mining Live Data Streams with Preserving Data Privacy" in Shakya S., Balas V.E., Kamolphiwong S., Du KL. (eds) Sentimental Analysis and Deep Learning. Advances in Intelligent Systems and Computing, vol 1408. Springer, Singapore. https://doi.org/10.1007/978-981-16-5157-1_63.
7. Rahul Patil, Chetana Chaudhari published a research paper on "Use of a Recurrent Neural Network to Identify Spammers on Twitter" in Shakya S., Balas V.E., Kamolphiwong S., Du KL. (eds) Sentimental Analysis and Deep Learning. Advances in Intelligent Systems and Computing, vol 1408. Springer, Singapore. https://doi.org/10.1007/978-981-16-5157-1_63.
8. Rahul Patil, Pramod Patil, Aditya Ghongade, Adriel Dsa, Parth Lokhande, Harsh Munot published a research paper on "Online System for Identifying Need of Machine Maintenance by Mining Data Streams and Handling Concept Drifts" in Shakya S., Balas V.E., Kamolphiwong S., Du KL. (eds) Sentimental Analysis and Deep Learning. Advances in Intelligent Systems and Computing, vol 1408. Springer, Singapore. https://doi.org/10.1007/978-981-16-5157-1_63.
9. Mrs. Swati Jaiswal filed a patent on "A device which helps to protect and secure children" with Application No: 2021105373 in the month of November 2021
10. Dr. Swati V Shinde, Ms. Madhura Kalbhore filed a patent on "Device for cervical Cancer Diagnosis " with Application No: 202121045164 in the month of November 2021
11. Sushma Vispute, Ishan Rao, Prathmesh Shirgire, Kedar Vyavhare, Sanket Sanganwar received copyright for his article "APPLICATION TO EXTRACT TEXT FROM REGISTER IMAGES USING PYTESSERACT" SW-15078/2021
12. Dr. Rachana Patil gave Invited talk on "Network Forensic Investigation and Evidence Collection", in International Conference on Forensic Science and Research at Luxembourg City, Belgium conducted in 15-17 Nov 2021
13. Prof. Anjana R.A. received "PMI Pune Deccan India Chapter Collaboration Award 2021" on 27th November 2021.
14. Dr. Varsha K.Harpale & Mrs.Ashwini S.Shinde organized a Three days State Level workshop on "Statistical Analysis for Audio and Biomedical Signal Processing" during 17/11/2021 to 19/11/2021. Dr. Kishor. S. Kinage, PCCOE, Pune, Dr. A.B.Kanwade SIT,Pune, Dr. Varsha K. Harpale, PCCOE, Pune, Dr. Ashwini M. Deshpande, MKSS's Cummins COE, Pune, Dr. Mrinal Bachute, SYMBIOSIS IT Pune, Dr. Surekha Bandal Reddy, IARE, Hyderabad are the speakers for that workshop .
15. Mr.Praful Shinkar attended online FDP on "Emerging Transportation Technologies for Sustainable Smart Cities" from 24-11-2021 to 26-11-2021.
16. Dr. Sandip T. Mali delivered a session on 'Waste To Energy' in AICTE ATAL FDP on Green Technology and Sustainability Engineering organized by Department of Civil and Environmental Engineering, KIT COE Kolhapur, on 26/11/2021.
17. Dr. Sandip T.Mali and Ms. Anushree Chandragade Organized a online Webinar through SIG WREE on "Analysis of Water distribution network using EPANET software' on 18/11/2021. Mrs Deepali Vaidya from SKN SIT Lonavala was the speaker and there are total 100 participant from all over Maharashtra and India and also from Tanzania , Gaborone (UN) , Saudi Arabia, Dar es Salaam, Germany
18. Ms. Anuja Jadhav, Dr. Roshani Raut, Dr. Sonali Patil, Ms. Chaitrali Sorte, Mr. Atul Kathole, Ms. Swati Jaiswal granted a International Patent on "Child Safety Device". Patent No. is 2021105373.
19. Mrs. Puja Pohakar, Dept of AS&H, published a research paper on "Early fault diagnosis in Electrical motors using AI technique" in Journal of Oriental Research Madras during November 2021, ISSN: 0022-3301. The paper was presented at an International conference on "Breakthrough to excellence held virtually held at school of Engineering, ADYPU during 6-8th Oct 2021.
20. Mr. R.T. Jagtap, Dept of AS&H, Published a research paper on "Synthesis, Characterization and Molecular Docking of Condensed Molecules of Halogen Derivatives of Some Naturally Occurring Quinones and Phenylene Diamines", in UGC care listed journal—"Journal of the Maharaja Sayajirao University of Baroda" ISSN: 0025-0422. The paper was presented in Multidisciplinary National Conference "Advanced Materials, Technology, Applications and Education" dated on 16/10/2021 organized by the Department of Physics, Hon. Balasaheb Jadhav College, Ale (Pune) in association with Savitribai Phule Pune University, Pune (Maharashtra).

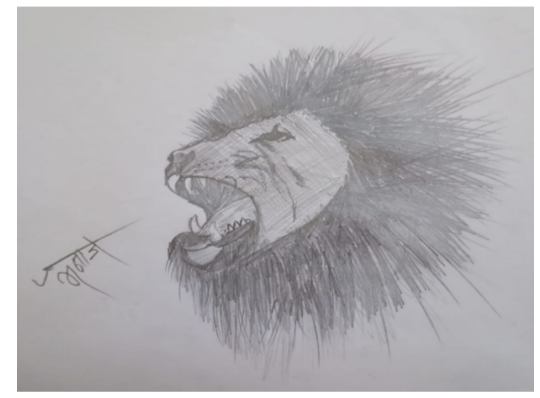
PCCoE Expressions



Painting by Mr. Shriyash Shinde, Dept. of Mechanical Engineering



Pencil Sketches by Mr. Manoj Thorat, E&TC department



PCCOE Announcements



AICTE - ISTE Sponsored Six Days Online Induction / Refresher Program on

3D Interaction Design using AR-VR

(23rd to 29th December 2021)
Convenor - Dr. Jayashree V. Katti

No registration fees

Registration Link:-

<https://forms.gle/UWOYkLMrmiH82Mtt8>

The website of Department of Civil was launched at the hands of Director Dr. G. N Kulkarni on 26/11/2021.