TECHNICAL NEWS LETTER

Governing Body Meeting

Governing Body Meeting

The Fourth meeting of the Governing Body (G.B.) of K. K. Wagh Institute of Engineering Education and Research, Nashik (Autonomous w.e.f. A.Y. 2022-23) was held on May 02, 2024, at 11:30 a.m.in offline mode. Director Prof. K. N. Nandurkar felicitated Hon. Vivek Sawant, Shri Sameer Wagh, Prof. G. V. Garje, Prof. Smt. M. B. Khambete, Shri Ashokbhai Merchant and other dignitaries. Dr. Sunil Kute presented all points of agenda of meeting one by one. Member discussed the issues at length and congratulated winners of various competitions at State and National Level.

F.Y. B.Tech. Project Exhibition cum Contest

Project Exhibition cum Contest

The Department of Applied Science in association with AICTE-IDEA LAB of K. K. Wagh Institute of Engineering Education and Research organised F.Y. B. Tech project Exhibition cum contest on Wednesday, 8th May, 2024.On the inaugural occasion of the competition, Chairman of the K. K. Wagh Education Society, Nashik Hon'ble Sameer Wagh, Director Dr. K. N. Nandurkar, Dr. Shantam Shukla, Dr. S. S. Sane, Dr. S. Y. Kute and other dignitaries were present. Hon'ble Sameer Wagh interacted with the students and appreciated their skills and hoped that with the help of the reasoning and use of advanced technology, these students will find effective solutions to many problems in the future. Mr. Vanky Kataria, Mrs. Snehal Bonde, Dr. M. N. Shelar, Prof. Poonam Fegade, Dr. D. Y. Patil and Prof. A. L. Mourya were the judges for the contest. Dr. A.W.M.H. Ansari and Prof. M. J. Kshirsagar coordinated this event under the guidance of Dr. V. K. Patil, F.Y. Coordinator and Dr. A. C. Pawar, HoD. (Applied Science).

The main objective of the project exhibition was to promote scientific and technical creativity among the students of First Year B.Tech. In the academic year 2023-24, students had prepared around 100 multi disciplinary projects under the subject of Engineering Exploration. While preparing these projects, the students were assisted by project coordinator under the guidance of respective HOD. Initially division wise project competition was held and from each division, best of 2 projects were selected thus total 34 Projects were selected for competition. Total 5 Groups were made based on their departments and from each group first and second winner were declared.

Some Winner Projects:

1. Crazy Explores - smart stair cleaner, prepared by Meghraj Bhavsar, Sahil Patil, Shrey Salunke, Areen Shinde from Computer Engineering department

2. Investment adviser chabot, prepared by Ahire Chaitanya Keshav, Bodkhe Kundan Bhaskar, Dhamane Sanmitra Bhushan, Bhagwat Om Dilip, Desale Jayesh Narendra from Robotics and Automation department

■ NBA Expert team visit to Institute

NBA Expert Visit

Mechanical Engineering Department was accredited by NBA for 3 years up to June 2024. For further extension of accreditation, a compliance report was submitted to NBA by the Department in December 2023. For document verification and evaluation, an expert team of NBA visited the Institute and the department on Saturday, 18 May 2024. Chairman of the expert team Prof. Dr. Harminder Singh Bains and member Prof. Dr. Ugrasen Suman thoroughly verified the relevant documents and also interacted with faculty of Mechanical Engineering department.

■ Project Exhibition cum Contest of Final Year Projects

Winner of Project Competition with faculty and Judges

Internal Quality Assurance Cell (IQAC) of the Institute had organized Project Exhibition cum Contest of Final Year Projects on 4th June 2024. The objective was appreciating the projects with innovative concepts for societal impact. Director, Dr. K. N. Nandurkar inaugurated this event along with Judges. Faculty members from various departments and students were present for the inauguration. Out of 302 final year projects, 30 projects were shortlisted for the competition. The prize distribution was held in the presence of Director, Dr. K. N. Nandurkar, Dr. Preeti Bhamre, Prof. Nitin Shahane, and the judges Mr. Nilesh

Salgaonkar, Director, Technocrat, Nashik, Mr. Mahendra Gaikwad, Mentor, JEE & NEET exams and Ms Prajakta Somani, Head of Software Development, ESDS, Nashik.The best project award at the Institute level was awarded to project titled"Design and development of prototype for Smart Oxygen Concentrator" comprising of Mr. Lagde Parth, Mr. Pawar Sudarshan, Mr. Patil Vinay, Mr. Sanap Sangam of Mechanical Engineering Department, under the guidance of Prof. P. R. Beldar. A total amount of Rs. 28,000/- was distributed as prizes. Various innovative and socially beneficial projects were undertaken by students. Projects were appreciated by the Judges.

■ Faculty visit to Gujarat Technological University (GTU), Gandhinagar

To study the NEP implementation and innovative academic practices, Faculty from KKWIEER including Principal Dr. K. N. Nandurkar, Dr. S. Y. Kute, Dr. P. J. Pawar and Dr. R. K. Munje visited Gujarat Technological University (GTU), Gandhinagar on 9th May 2024. The team interacted with Hon. Vice Chancellor GTU Dr. Rajul Gajjar and Hon. Registrar Dr. K. N. Kher. During this visit the team also got acquainted with the functioning of its various schools and sections such as School of Engineering and Technology, School of Management studies, School of Applied Science and Technology, Center of Indian Knowledge System- Dharohar etc.

■ Visit of Hon. Chairman and Faculty to Sanjivani University, Kopargaon

Hon. Chairman Shri. Sameer Wagh, Hon. Secretary Prof. K. S. Bandi and K. K. Wagh faculty team including Dr. K. N. Nandurkar Prof. P. T. Kadave, Dr. D. M. Chandwadkar, Dr. P. J. Pawar, Dr. P. K. Shahabadkar, Dr. N. S. Patil, Prof. V. S. Tarle visited Sanjivani University, Koparagaon on 30th May 2024. During this visit the team

interacted with Managing Trustee Shri. Amitji Kolhe to get acquainted with the infrastructure facilities, rules, regulations and norms required to set up Self Financed University.

■ Expert Lecture/Seminar/Courses/Workshop Organized:

- Science Department organised Expert lecture of Dr. Sharad S. Gaikwad gave an expert talk on the topic Environmental Mentoringto F. Y. B. Tech students of division L and M in MCA Hall.

- Electronics and Telecommunication Engineering Department staff Dr. S. P. Ugale, Dr. (Mrs.) S. M. Kamalapurkar and Mr. Ganesh Jadhav had participated in one day workshop on National education Policy (NEP) 2020 organized by Sanjivani College of Engineering, Kopargaon on 11/05/2024.

- Dr. Saurabh Srivastava Completed NPTEL online certification course on Pattern Recognition and Application with a consolidated score of 82%. Dr. Saurabh Srivastava worked as a reviewer for 2024 IEEE First International Conference on Recent Innovation in Smart and Sustainable Technology organized by the departments of ECE and EEE Presidency University Bengluru on 15th and 16t March 2024. Dr. Saurabh Srivastava worked as a reviewer for the 3rd International conference on Optoelectronic Information and Computer Engineering on May 25-27, 2024. Mrs. P. P. Patil attended 8 days FDP on NEP 2020 Orientation & Sensitization Programme from 20/05/2024 to 28/05/2024.

- Mechanical Engineering Staff Dr. P.B.Kushare attended Ansys Academics Innovation Conference Nashik on May30,2024.

- Information Technology Departmental staff Prof. Poonam Patil has successfully completed the requirement to be recognized as a PDRL Certified Drone Professional (PCDP). Prof. Ms. Nagama Kazzi has successfully completed online courses on "SQL Projects for Beginners" and "Mongodb Tutorial" provided by Great Learning Academy. Prof. Ms. Nagama Kazzi has successfully completed Udemy course on "Java script framework 6 with Spring Boot 3 - Telusko"

■ Training & Placement :

Company Name	Department Name	Placed Students
Force Motors	Electronics Telecom Engg.	06
Rishabh Instruments	Electronics Telecom Engg.	02
NxtQube Aerogravity Pvt.Ltd.	Arti. Int. & Data Science	01
Yotta infrastructure	Arti. Int. & Data Science	04

■ Industrial Visit

Sr. No.	Company Name	Department Name	Date
1	ESDS Nashik	Artificial Intelligence and Data Science	02/05/2024

Congratulation !

■ Competitive Exam Qualified students

Sr. No.	Department	Exam Qualified	No. Students
1	Mechanical Engineering	GATE	02
2	Mechanical Engineering	CAT / MAT	03
3	Electronics and Telecommunication Engineering	GATE	05

■ University Ranker of F.E. (Branch wise) University Exam A.Y. 2022-23

Sr. No.	Branch	No. of Rankers (Branchwise)
1	AIDS	2
2	Computer	18
3	Electrical	14
4	E&TC	2
5	I.T.	16
	Total	39

■ University Ranker of S.E. to B.E. (Branch wise) University Exam A.Y. 2022-23

Sr. No.	Branch	Class	No. of Rankers (Branchwise)
1	Chemical	BE	09
2	Mechanical	SE	2
		BE	6
3	E&TC	BE	2
4	I.T.	SE	1

■ Other Achievements:

- Visit of Dr. K. N. Nandurkar to Machine Tool Expo 2024 Moshi for exploring collaboration with industries.

- Dr. K. N. Nandurkar attended the Second meeting of CII Maharashtra State Council at Sula Wine Yard as Co Convenor of Industry Academia Connect Pannel of CII for Year 2024-25.

- Visit to MIT WPU Pune by Dr. K. N. Nandurkar and Prod. Dr. N. B. Gurule to review workshop facilities and discuss with Ph. D Students about their research.

K K Wagh Education Society's

K K Wagh Institute of Engineering Education and Research, Nashik.

TECHNICAL NEWS LETTER : May - 2024

■ Abstracts of papers presented during May 2024

Comparative analysis of mechanical properties of SiC particle addition on Al6061/Ni and Al6061/Cr metal matrix composites

Prof. Pankaj Beldar

(Published in Science Direct, Elsevier)

Abstract: This research paper investigates the mechanical characteristics of Al6061/Nickel (Ni) and Al6061/Chromium (Cr) metal matrix composites (MMCs) with varying proportions of Ni and Cr by weight. The proportions of Ni and Cr range from 0% to 2.7% weight. Experimental results reveal that the optimum mechanical properties are achieved at 1.8% weight for Ni. Subsequently, SiC (silicon carbide) particles are added to Al6061/Ni MMCs at varying weight percentages (0%, 1%, 3%, 5%, and 7%) to evaluate their impact on performance. The study demonstrates that the combination of 1.8% Ni and 7% SiC in Al6061 exhibits the most favorable properties. Tensile test is carried out with ASTM D 3552 standard; Flexural strength is assessed through ASTM D790, Microhardness by ASTM E384, and Impact strength by ASTM D256. Overall, Al6061/Ni MMCs exhibit superior mechanical performance compared to Al6061/Cr MMCs, with Al6061/Cr MMCs excelling in elongation, flexural strength, and impact strength. This investigation confirms that the addition of nickel and chromium to the Al6061 alloy induces structural modifications that enhance its mechanical properties. The findings provide valuable insights for optimizing the design and fabrication of MMCs for various engineering applications.

Keywords: Metallic composites, Composite materials, Elastic properties, Metals and alloys

■ Influence of Compacting Pressure and Sintering Temperature Effect on Microstructure Characteristics and Tribological Performance of Ni-Cr-MoS2 Based Composite

Dr. V. K. Matsagar and Dr. P. B. Kushare

(Published in World Scientific Publishing Company)

Abstract: Ni-Cr-MoS 2 based composite's microstructure and wear behaviour were examined in relation to compacting pressure and sintering temperature. The tribological performance of Ni-Cr-MoS 2composite against En32 martial is examined in this research in relation to the nodule count, particle count, and average area depending on the compacting pressure and sintering temperature. The green pallets were cylindrical in shape and had a diameter of 12.5 mm 30 mm. They were pressed at room temperature (28°C) with axial pressures of 220 MPa, 275 MPa, and 330 MPa, then sintered in two batches at different sintering temperatures of 900 0 C and 1000 0 C. By using Image analysis the amount of nodules, their size, particle counts, particle sizes, and lubricant flakes are investigated of developed composite. The typical nodule size ranges from 46μm to 60 μm, and the average nodule percentage is between 67 and 79 are present in Ni-Cr-MoS 2 based composite. Particle counts ranged present 29 to 516 depending on the sintering temperature and compacting pressure. Up to 1.1472 μm, lubricant flake lengths were nearly same for composite for the different compacting pressure and sintering. With varying compacting pressures and sintering temperatures, the coefficient of friction and wear rate varied for developed Ni-Cr-MoS 2 composite. The impact of the nodule, nodule counts, particle and particle size also present on the developed composites for friction and wear. Minimum wear rate observed for composite sintered under 1000 0 C temperature, and maximum wear rate 7.55E - 8 mm 3 /Nm for low compacting pressure and 900 0 C sintering temperature.

Keywords: Image analysis, Microstructure characterization, Friction and Wear

■ Genetic Algorithm Application for Improving the Performance of Teaching Learning Process through Collaborative Learningin the conference: 5th Doctoral Symposium on Computational Intelligence

Prof. Dr. P. J. Pawar

Abstract: Collaborative learning proves to be one of the greatest academia continuous improvement tools. Previous study indicated

different methods depending upon different traits of the learners are found to be effective in group formation, however the students mark utilization in group formation is not explicitly used. Thus, this paper proposed a student's group formation with intra and inter group knowledge transfer as a focused approach supported with mathematical model which is optimized using a strong optimization tool real coded genetic algorithm (RCGA). Mathematical model is supported with hypothetical example. The first-generation solutions after implementing the real coded genetic algorithm shows significant improvement in fitness function. Also, an improvement of 5% in the average fitness value over that of initial population observed. The fitness function will keep on improving in subsequent generations which proved the robustness of the proposed model.

Nutritional Analysis using Deep Learning: A Revolution in Understanding Dietary Patterns

Prof. Ms. Pragati Pandit, Prof. Ms. Nagama Kazzi

Abstract: Nutritional analysis using deep learning represents a ground-breaking approach to understanding and managing dietary patterns in the modern era. This essay explores the advancements and challenges in this field. Traditional methods of dietary assessment, fraught with subjectivity and error, have given way to the precision and convenience offered by deep learning. Deep learning models, such as Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), excel in image-based food recognition and nutrient prediction, enabling real-time tracking, personalized nutrition recommendations, and improved dietary planning. However, challenges persist, including data quality, portion estimation, privacy concerns, and regulatory considerations. Despite these obstacles, deep learning applications are already making significant impacts, from dietary monitoring apps to clinical nutrition and public health initiatives. The future holds promise, with efforts underway to enhance data quality, interpretability, cultural sensitivity, and ethical considerations. In conclusion, deep learning in nutritional analysis offers a transformative pathway to healthier lives, demanding continued research, and ethical considerations for its widespread adoption.

Integrated Real Time Traffic Analysis System

Akshay Chavan, Shivam Chavan, Aditya Parkhe, Abhishek Patil and Prof.Smita Chaudhari

Abstract: The rapid boom of urbanization and transportation demands has considerably elevated complexity of coping with visitors gliding on highways. This mission introduces a progressive real-time machine that inte- grates car counting, classification, vehicle type, and emblem detection with the usage of deep getting-to-know methodologies. The motive of this mission is to decorate highway site visitors' control by imparting comprehensive insights into vehicle motion patterns. Employing cutting- edge convolutional neural networks which include YOLO(You Only Look Once), the gadget achieves precise and adaptable automobile detection acrossvarious environmental situations. In addition to accurate vehicle detection and counting, this mission uniquelyextends its competencies to perceive automobile kinds and brands. By leveraging the electricity of deep studying, the machine can distinguish between exceptional car categories or even understand unique brands, contributing to richer visitor insights. The real-time nature of the system guarantees timely records shipping for informed choice-making in visitormanagement and infrastructure planning. Extensive experimentation with real-international toll road video information validates the system's first-rate accuracy, processing velocity, and effectiveness as compared to traditional techniques. This mission represents a full-size development in highway traffic control, offering a comprehensive,

real-time, vision-primarily based answer that encompassesdetection, counting, and type of vehicle kinds and brands.

Keywords: Vehicle Dataset, Image Segmentation, Vehicle detection, Vehicle counting, Highway management

■ Chemical route synthesis of nanohybrid MoO3-rGO for high-performancehybrid supercapacitors

Dr. Mrs. A. C. Pawar

(Published in Journal of Energy Storage)

Abstract: Asymmetric Hybrid super capacitor (AHS) is distinguished by a combination of electrostatic and electrochemical storage mechanisms. High performance of AHS is based on MoO_3 (MO) hybridized with reduced graphene oxide (rGO). In the present study, a single step hydrothermal method was used to synthesise MO and MoO_3-rGO (MOG) nanohybrid materials. MO and MOG samples were then used to prepare electrodes. These electrodes were subjected to CV, GCD, and EIS analyses with three- and two-electrode systems. Results showed that the MOG-2 composite achieved a higher specific capacity of 607.82 C g^{-1} than bare MO at 96 C g^{-1} at a sweep rate of 2 mVs^{-1} in the three-electrode system. Thus, rGO can effectively enhance active sites for redox reactions. At current density of 1 A g^{-1}, the MOG//rGO had the highest specific capacity of 188.40 C g^{-1}. Based on GCD evaluation, the HSC coin cell device had a maximum energy density of 36.78 Whkg^{-1} and a power density 2546.84 Wkg^{-1}and the device retained 87.6 % capacity after 10,000 cycles.

■ Perovskite solar cells: Fundamental aspects, stability challenges, and future prospectsin Progress in Solid State Chemistry

Dr. Mrs. A.C. Pawar, Prof. S.S. Kahandal, Prof. R.S. Tupke

Abstract: Interest in perovskite solar cell (PSC) research is increasing because PSC has a remarkable power conversion efficiency (PCE), which has notably risen to 28.3 %. However, commercialization of PSCs faces a significant obstacle due to their stability issues. This review article primarily focuses on several key aspects of PSCs, including different types of solar cells, their construction and operational mechanisms, efficiency, and overall stability. It explains the structure and functioning of PSCs, covering materials and components used for absorber layer, electron-transport layer, hole-transport layer, and electrodes. This review emphasized stability challenges associated with PSCs and discussed various factors and issues contributing to the degradation of these solar cells over time. It then provided a concise overview of different strategies and ongoing efforts taken to enhance the stability of PSCs. It also summarized various approaches used to improve their durability. In summary, this article offers a comprehensive exploration of PSCs, encompassing their construction, operation, improvement in efficiency, and obstacles related to their long-term stability. Furthermore, it addresses factors influencing PSC stability and outlines future challenges, focusing on prolonging their lifespan and enhancing stability for broader applications. Finally, this article has tackled various possible solutions to address the challenges encountered by the PSCs.

F.Y. B.Tech. Project Exhibition cum Contest

Prof. Dr. K. N. Nandurkar
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