Department of Mechanical Engineering

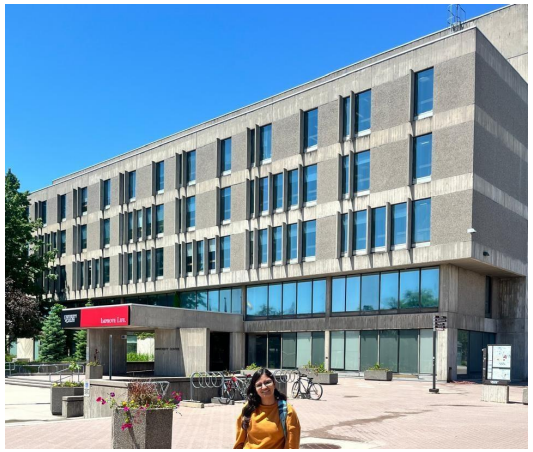
STUDENT ACHIEVEMENTS

FINAL YEAR STUDENT ATAM SWAROOP AND ARPIT KAPOOR PARTICIPATION IN NATIONAL SIH 2024

Two final year students, **Mohit Gautam (2104391) and Nitin Tyagi (2104397)**, of B.Tech. Mechanical Engineering has been awarded with the **UP Council of Science and Technology aid** for their Project **"Design and fabrication of industrial exoskeleton finger using 3D printing", Project ID – 1642 (2024-25).**

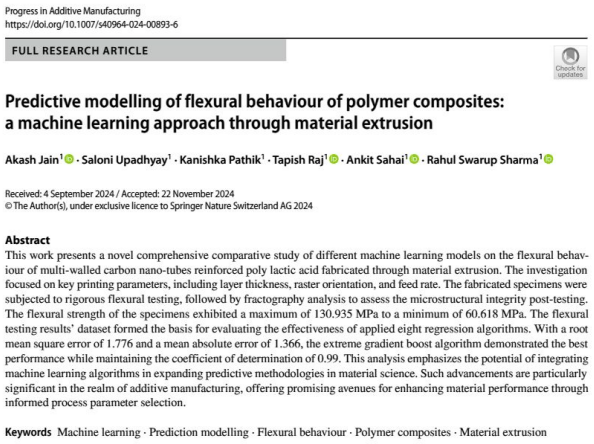
Under this scheme the students will get from UP Council of Science and Technology INR 20000/- for the execution of their project idea.

Department of Mechanical Engineering
Student achievements / honors / participation (2024-2025)



Saloni Upadhyay pursued her Research Internship at the **University of Guelph, Canada** under the **MITACS Globalink research internship Programme** offered by the Canadian Government.

Saloni along with her colleague, **Kanishka** attended the "**International Conference on Design and Manufacturing Technologies 2024** " and received the **"Best Paper Award".**



Progress in Additive Manufacturing
https://doi.org/10.1007/s40964-024-00893-6

FULL RESEARCH ARTICLE

Predictive modelling of flexural behaviour of polymer composites: a machine learning approach through material extrusion

Akash Jain[1] · Saloni Upadhyay[1] · Kanishka Pathik[1] · Tapish Raj[1] · Ankit Sahai[1] · Rahul Swarup Sharma[1]

Received: 4 September 2024 / Accepted: 22 November 2024

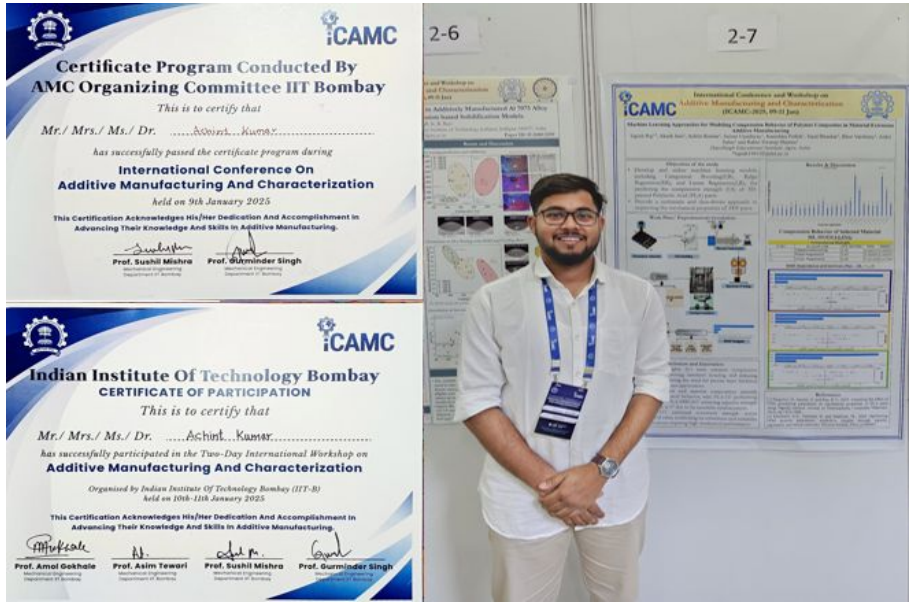
Abstract
This work presents a novel comprehensive comparative study of different machine learning models on the flexural behaviour of multi-walled carbon nano-tubes reinforced poly lactic acid fabricated through material extrusion. The investigation focused on key printing parameters, including layer thickness, raster orientation, and feed rate. The fabricated specimens were subjected to rigorous flexural testing, followed by fractography analysis to assess the microstructural integrity post-testing. The flexural strength of the specimens exhibited a maximum of 130.935 MPa to a minimum of 60.618 MPa. The flexural testing results' dataset formed the basis for evaluating the effectiveness of applied eight regression algorithms. With a root mean square error of 1.776 and a mean absolute error of 1.366, the extreme gradient boost algorithm demonstrated the best performance while maintaining the coefficient of determination of 0.99. This analysis emphasizes the potential of integrating machine learning algorithms in expanding predictive methodologies in material science. Such advancements are particularly significant in the realm of additive manufacturing, offering promising avenues for enhancing material performance through informed process parameter selection.

Keywords Machine learning · Prediction modelling · Flexural behaviour · Polymer composites · Material extrusion

Saloni has co-authored and published a research paper in the journal **Progress in Additive Manufacturing** (Impact Factor: 4.5) as an outcome of her major project work.

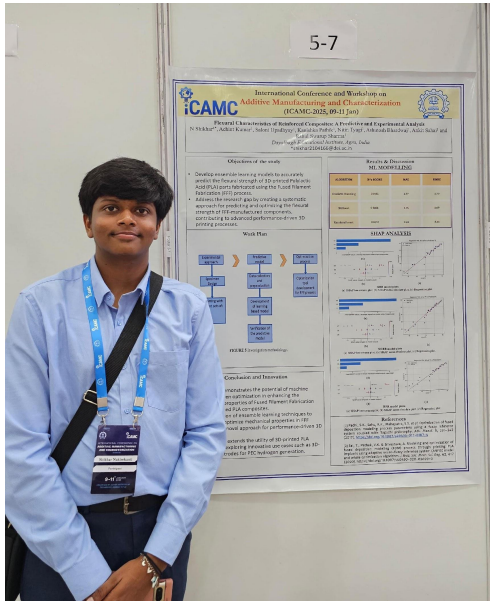
Department of Mechanical Engineering

STUDENT ACHIEVEMENTS



Achint Kumar and **N. Shikhar** final-year students, presented a two research posters in **ICAMC 2025**, organized by **IIT Bombay**.

Both final-year students, successfully participated in a two-day international workshop on Additive Manufacturing and Characterization and a certificate program organized by **IIT Bombay**.



N. Shikhar Presented a poster at the Sixth Winter Session of Dayalbagh Science of Consciousness (DSC 2025).

Samarth Jain, a final-year student, had his research paper titled "*Numerical Investigation of CH_4-H_2-Air Combustion in a J79 Jet Engine Combustor*" selected for presentation at the ACGT International Conference held at IIT Kanpur in 2024.

Department of Mechanical Engineering

STUDENT ACHIEVEMENTS

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

सत्यमेव जयते
GOVERNMENT OF INDIA

Controller General of Patents,Designs and Trademarks
Department of Industrial Policy and Promotion
Ministry of Commerce and Industry

Design Application Details

Application Number:	432262-001
Cbr Number:	217912
Cbr Date:	30/09/2024 16:25:35
Applicant Name:	**1. Mohit Gautam** **2. Sachin Kumar** **3. Manoj Kumar** **4. Aditya Sharma**

Design Application Status

Application Status: Application Under Process(wating for Technical Examination)

Back

Mohit Gautam, final year student, has received grant for the sanctioned project **(Project ID – 1624)** under *CST UP ENGINEERING STUDENT'S PROJECT GRANT SCHEME 2024-25 from U.P. Government* and a design patent **(IN 434542-001)** certified, also a design patent *(434541-001)* granted and one design patent *(432262-001)* on FER stage.

INTELLECTUAL PROPERTY INDIA

ORIGINAL
क्रम सं/ Serial No. : 187971

पेटेंट कार्यालय, भारत सरकार — The Patent Office, Government Of India

डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design

डिजाइन सं. / Design No. : 434542-001

तारीख / Date : 16/10/2024

पारस्परिकता तारीख / Reciprocity Date* :

देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो *A MULTI UTILITY STOOL* से संबंधित है, का पंजीकरण, श्रेणी 06-03 में 1.Aditya Sharma 2. Manoj Kumar 3.Mohit Gautam 4.Sachin Kumar के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 06-03 in respect of the application of such design to *A MULTI UTILITY STOOL* in the name of 1.Aditya Sharma 2. Manoj Kumar 3.Mohit Gautam 4.Sachin Kumar.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।
In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

जारी करने की तिथि / Date of Issue : 23/12/2024

महानियंत्रक पेटेंट, डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

*पारस्परिकता तारीख (यदि कोई हो), जिसकी अनुमति दी गई है, तथा देश का नाम। डिजाइन का स्वत्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।
The reciprocity date (if any) which has been allowed and the name of the country. Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years. This Certificate is not for use in legal proceedings or for obtaining registration abroad.

soonami.io GmbH
2,949 followers
7mo •

Venture forward with soonami's Venturethon, a program designed to propel early-stage Web3, AI, or Gaming projects into successful ventures.

🏆🏆🏆Nihal Saran Das Duggirala's project deGuppe clinched the titles of "Web3 and AI for Good," "IITD Tryst," and "Best Live Demo" in the March edition of soonami Venturethon. Following this success, Nihal will now stand a chance to present before the Investment Committee (IC), as long as he remains committed to the program. Give Nihal's story a read:

Nihal Saran Das Duggirala, Final year student, won the titles- "**Web3 and AI for Good**", "IITD Tryst" and "Best Live Demo" in the March edition of soonami Venturethon Cohort-3 with a prize money of **1500 US Dollars** .

Department of Mechanical Engineering

STUDENT ACHIEVEMENTS

THE 6TH INTERNATIONAL CONFERENCE ON DAYALBAGH (ART) SCIENCE (& ENGINEERING) OF (EVOLUTIONARY/RE-EVOLUTIONARY) CONSCIOUSNESS (DSC)
&
THE 47TH (INTER) NATIONAL SYSTEMS CONFERENCE (NSC)
SYSTEMS FOR SUSTAINABLE DEVELOPMENT IN QUINTESSENTIAL HARMONY WITH ENVIRONMENT
23-25 September, 2024

BEST ORAL PRESENTATION(NSC)

IN THE TRACK – "EDUCATION, LITERARY AND SOCIAL SYSTEMS"
AWARDED TO
TAPISH RAJ, AKASH JAIN, ANKIT SAHAI, AND RAHUL SWARUP SHARMA
FOR PRESENTING THE PAPER TITLED
INFLUENCE OF PRINTING PARAMETERS ON THE MECHANICAL PROPERTIES OF FFF-PRINTED PLA AND PETG COMPOSITES

PROF. ANAND SRIVASTAVA, ORGANIZER, DSC
PROF. K. SOAMI DAYAL, SECRETARY, SSI AND CO-ORGANIZER, DSC
PROF. SANJAY BHUSHAN, CONVENER, NSC

Tapish Raj, PhD scholar of Mechanical Engineering department got the **best paper award in 6th International Conference on Dayalbagh (Art) Science (& Engineering) of (Evolutionary/Revolutionary) Consciousness (DSC) & the 47th (Inter) National Systems Conference (NSC), September 23-25, 2024**, paper titled **"Influence of Printing Parameters on the Mechanical Properties of FFF-Printed PLA and PETG Composites".**

The Patent Office, Government Of India
Patent Certificate

Bobby Tyagi, **Abhishek Raj**, Ph.D. scholars and Deepansh Dhall, 3rd-year Mechanical Engineering student, has been successfully Granted the patent titled **"Polymer Filament Fabrication System for In-Situ Fabrication and Spooling of Reinforced Filament"** Indian Patent Application **No. 202311060871**.

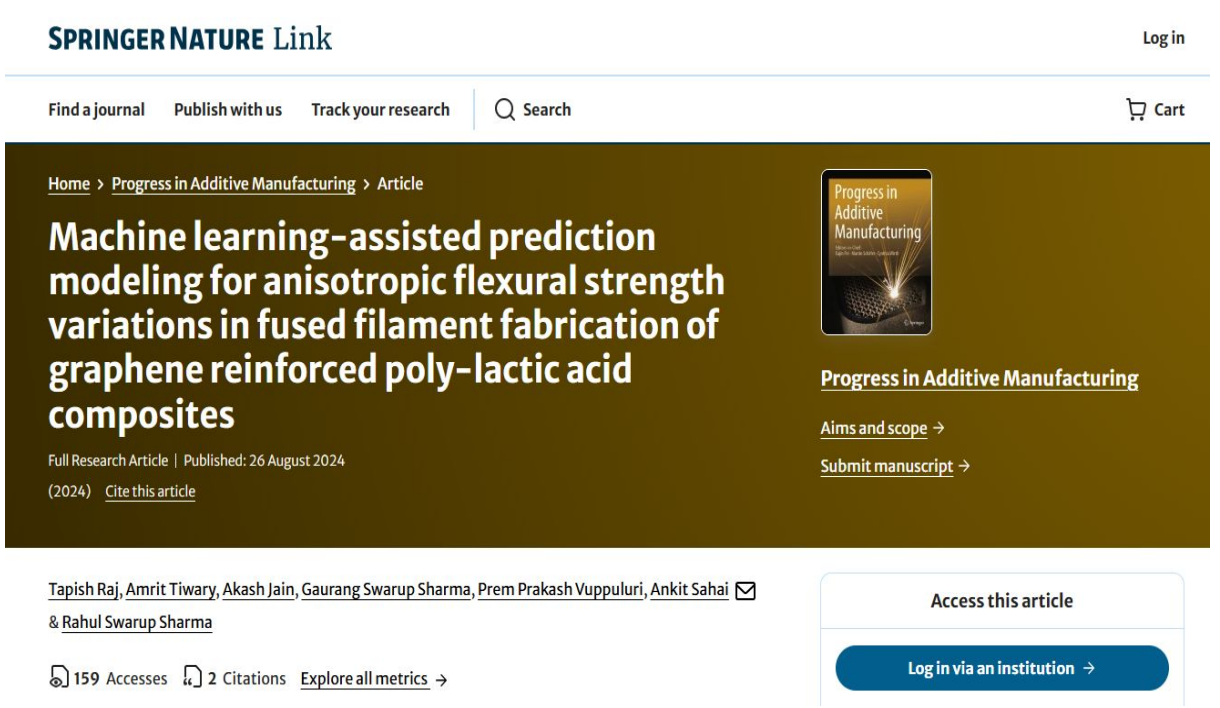
The Patent Office, Government Of India
Patent Certificate

Bobby Tyagi, **Abhishek Raj**, Ph.D. scholars and Deepansh Dhall, 3rd-year Mechanical Engineering student, has been successfully Granted the patent titled **"Amputee Leftover Limb Stabilization (ALLIS) Device"**. Indian Patent Application **No. 202311048777**

Department of Mechanical Engineering

STUDENT ACHIEVEMENTS

Deepansh Dhall, 3rd-year Mechanical Engineering student, presented a research poster titled "Enhancing Impact Performance of Fused Filament Fabricated Polymer Composites: An Experimental and Statistical Investigation" in **I-4AM 2024** conference organized by **IISC Bangalore**, presented a research poster titled "Development of Electrochemical Energy Storage Devices through Fused Filament Fabrication" in **E2M 2024** conference organized by **IIT INDORE**.



Amrit Tiwary, B.Tech. final year student, as outcome of major project work, has published a research paper titled **"Machine learning-assisted prediction modeling for anisotropic flexural strength variations in fused filament fabrication of graphene reinforced poly-lactic acid composites",** ***Progress in Additive Manufacturing, Springer Nature, August 2024*** **(Impact Factor: 4.5)**