Details of the Awards received by Students/Scholars of the Department of Mechanical Engineering, Faculty of Engineering, DEI

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

Kanishka Pathik, B.Tech. final year student, presented research paper on "Comparative Study of Prediction Models on the Tensile Behavior of Polymer Composites via Fused Filament Fabrication" in (ICDMT) 2024, Jointly organized by Punjab Engineering College (PEC), IIT Roorkee, and CSIR-Central Scientific Instruments Organization (November 8th – 10th).

PEC

ICDMT 2024

International Conference on Design and Manufacturing Technologies

(ICDMT 2024)

BEST PAPER AWARD

This is to certify that Prof./ Dr./ ~~Mr./~~ Ms. KANISHKA PATHIK of DAYAL BAGH, EDUCATIONAL INSTITUTE, AGRA has been awarded *"Best Paper Award"* in the *International Conference on Design and Manufacturing Technologies (ICDMT 2024), held at Department of Mechanical Engineering, Punjab Engineering College, Chandigarh from 8th-10th November 2024, jointly organized by Punjab Engineering College, Chandigarh, Design Innovation Center (DIC), IIT, Roorkee & Central Scientific Instruments Organization (CSIO) Chandigarh.*

CELEBRATING 100 YEARS

Chairman ICDMT 2024 | Co-Chairman ICDMT 2024 | Organizing Chair ICDMT 2024

DEE | SERB

Kanishka Pathik , B.Tech. final year student, received Best Paper Award at International Conference on Design and Manufacturing Technologies (ICDMT) 2024, Jointly organized by Punjab Engineering College (PEC), IIT Roorkee, and CSIR-Central Scientific Instruments Organization (November 8th – 10th).

Saloni Upadhyay & Kanishka Pathik, B.Tech. final year students, has published a research paper titled “Predictive modelling of flexural behavior of polymer composites: a machine learning approach through material extrusion” in the journal *Progress in Additive Manufacturing, Springer Nature, Dec 2024* (Impact Factor: 4.5)

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

FULL RESEARCH ARTICLE

Check for updates

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]

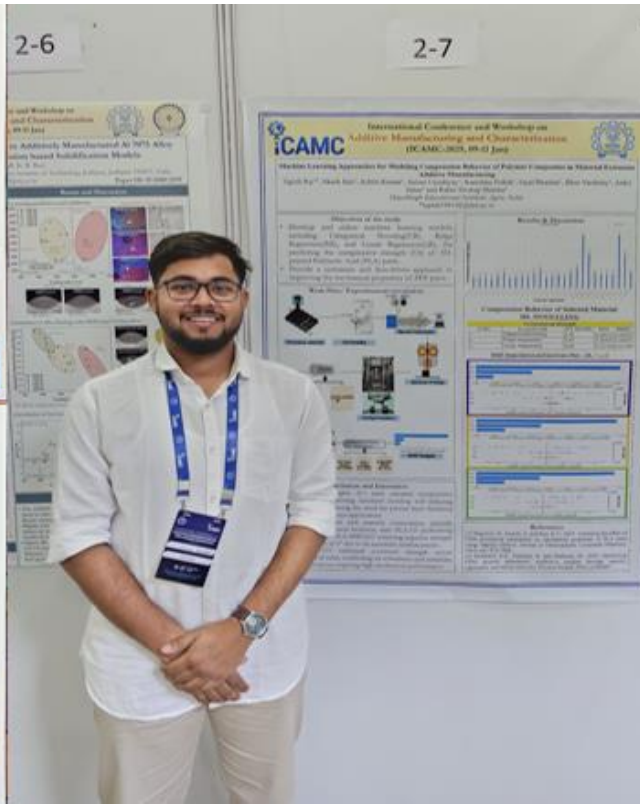
Received: 4 September 2024 / Accepted: 22 November 2024

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

Achint Kumar, final-year student, presented a research poster titled "Machine Learning Approaches for Modeling Compression Behavior of Polymer Composites in Material Extrusion Additive Manufacturing" in ICAMC 2025, organized by IIT Bombay.

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



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

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

Bobhy 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.

Bobhy 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

The Patent Office, Government Of India
Patent Certificate

The Patent Office, Government Of India
Patent Certificate

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 Bengalore.

Deepansh Dhall, 3rd-year Mechanical Engineering student, presented a research poster titled "Development of Electrochemical Energy Storage Devices through Fused Filament Fabrication" in E2M 2024 conference organized by IIT INDORE.

Deepansh Dhall, 3rd-year Mechanical Engineering student along with Engineering team, has won the Inter faculty Football Tournament, organized by Dayalbagh Educational Institute.


DAYALBAGH EDUCATIONAL INSTITUTE
(DEEMED to be UNIVERSITY)
DAYALBAGH, AGRA

Certificate

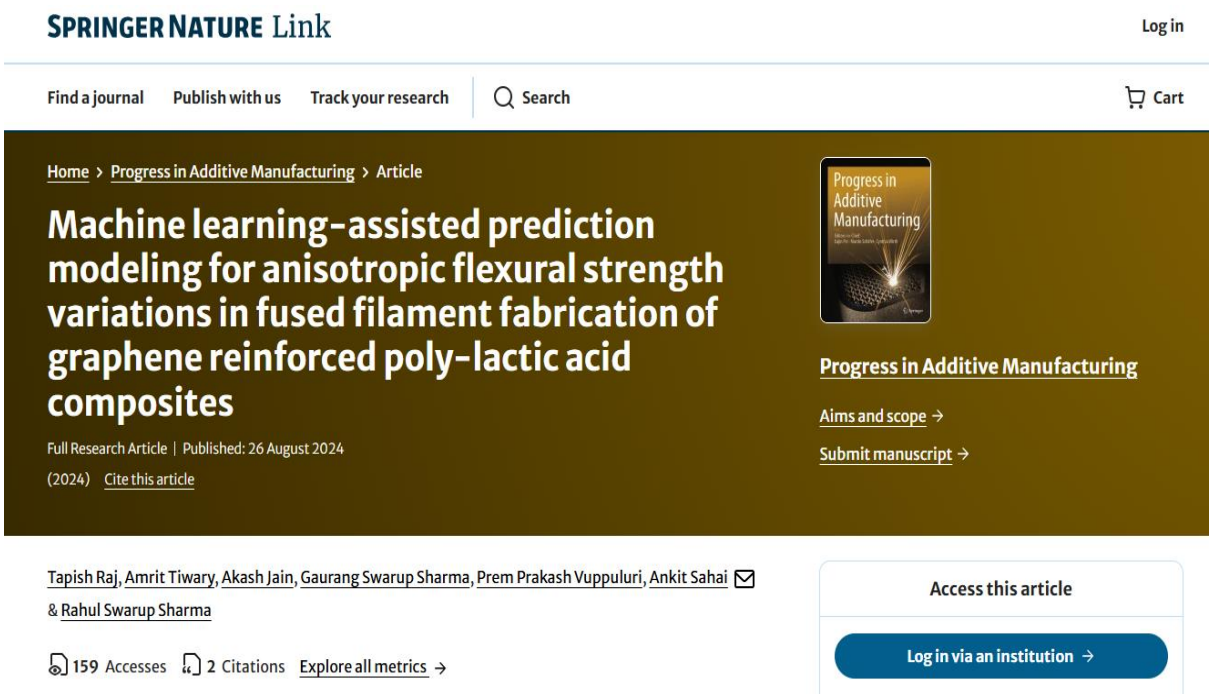
SESSION : 2023 -2024

This is to certify that DEEPANSH DHALL Son / Daughter of MR. DEEPAK DHALL was a member of ENGINEERING Faculty / College FOOTBALL [Boy's] team and Participated / Stood First / Second / Third in the Institute Tournament.

Date 06 to 11 Oct 2023

SPORTS CO-ORDINATOR | CONVENOR | DRG. SECRETARY | SECRETARY

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)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Machine learning-assisted prediction modeling for anisotropic flexural strength variations in fused filament fabrication of graphene reinforced poly-lactic acid composites

Full Research Article | Published: 26 August 2024

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Tapish Raj, Amrit Tiwary, Akash Jain, Gaurang Swarup Sharma, Prem Prakash Vuppuluri, Ankit Sahai & Rahul Swarup Sharma

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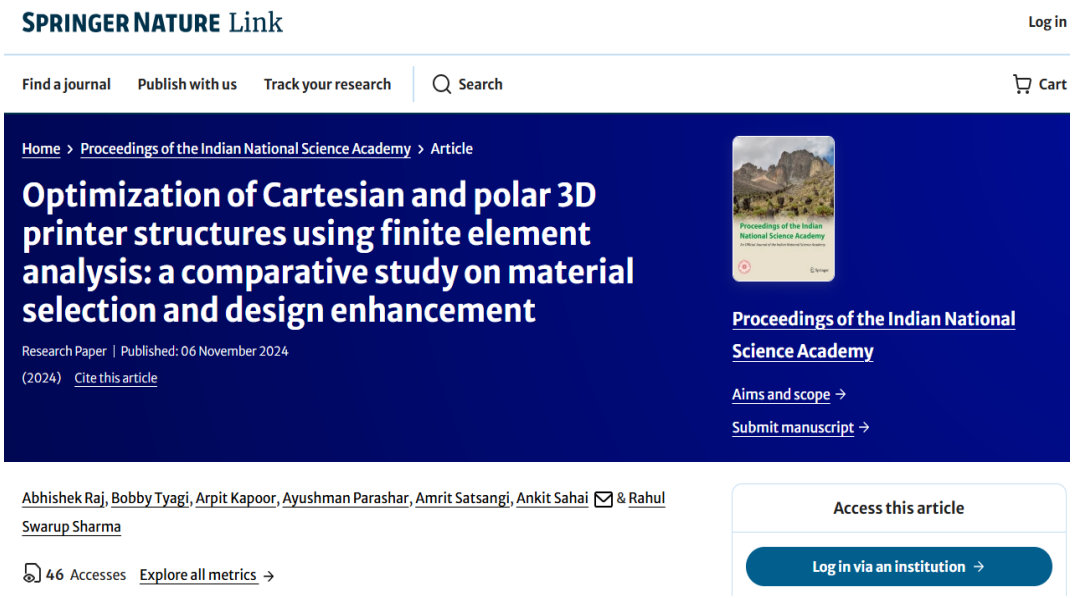
Arpit Kapoor, Ayushman Parashar and Amrit Satsangi final year student, as outcome of major project work, has published a research paper titled "Optimization of Cartesian and polar 3D printer structures using finite element analysis: a comparative study on material selection and design enhancement", *Proc.Indian Natl. Sci. Acad. Springer Nature,* november (2024) (Impact Factor: 1.2)



Samarth Jain, final year student, has presented a paper in the Asian Congress on Gas Turbines at IIT Kanpur, 21-23rd August 2024.

Mohit Gautam and Nitin Tyagi, final year students, were **awarded UPCST Project Titled "Design and fabrication of industrial exoskeleton finger using 3D printing"**