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PRESS RELEASE

The innovative research of DR Rahul MR, Asst. Prof of Department of Fuel, Minerals and Metallurgical Engineering of IIT (ISM) for design of alloys using Machine Learning places IIT (ISM) in 7th Position Globally in the use of Machine Learning for designing high entropy alloys.

The path breaking research of Prof Rahul MR Asst. Prof of Department of Fuel, Minerals and Metallurgical Engineering of IIT (ISM) with regard to design of alloys using Machine Learning (ML), has placed IIT (ISM) in 7th Position Globally in the use of Machine Learning for designing high entropy alloys.

Prof Rahul who is Indian pioneer with regard to the use of machine learning for alloy design has focused on high entropy alloys (HEA), a relatively new concept, which are over conventional alloys, especially in high temperature and biomedical applications.

It is worthwhile to mention here that high entropy alloys are that are formed by mixing of equal or relatively large proportion of five or more elements

Prof Rajiv Shekhar, Director IIT (ISM) said, "What is indeed remarkable is that Prof. Rahul's research was conducted with the help of B Tech, and not PhD, students" further said Prof Shekhar.

Alloys play a critical role in industry sectors ranging from transportation to manufacturing to medical equipment. The use of machine learning is expected to revolutionize the process of alloy design, reducing their lead time for commercialization from the 10 – 12 years of previous times to a couple of years.

 "The design and development of new materials are inevitable for advanced applications" said Prof Rahul and added that the conventional material development approach requires many experimental trials, resources and time.

"Recently the application of Artificial Intelligence has been getting attention in many fields" elaborated Prof Rahul

"We have used Machine Learning approach to solve the problems of Prediction of Phase formation in new alloys, prediction of their mechanical properties, microstructure classification and enhancement of alloys, identifying defects in additive manufacturing condition and developing ML-enabled processing map.

"The application of ML minimizes the resource and time required for developing new alloys" further said Prof Rahul" explained Prof Rahul and added that excerpts of his latest research which began with B Tech students of his department in 2020 has been published in journals like Scripta Materialia, Computation Material Science, Journal of alloys and compounds

Prof Rahul who joined IIT (ISM) as assistant professor in July 2000 is working on several ongoing projects including two externally funded projects one of which is of Rs 30.91 Lakh, titled-**Machine Learning Enable Framework for the Design of new multicomponent alloy** and other of Rs 28.36 lakh titled-Development of Microstructure, Property, Processing, Correlations for Nickel based super alloys.

This apart he is also working on a project titled, Rapid Solidification Studies for design of alloys for additive manufacturing.

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