National Institute of Technology Rourkela

## Departmental Seminar

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| Seminar Title | : Prediction of Heatwaves over India region using Artificial Intelligence and Machine Learning models |
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| Venue | : ER-303 CLASS ROOM |
| Date and Time | : 26 Sep 2024 (4:10) |

Abstract : India suffers from major heatwaves during March to June. Heatwave causes adverse effect on health and discomfort to many people; severe heatwaves may lead to the human and animal mortality. Heatwaves also significantly impact the agriculture production, tourism, industrial activity and many other sectors. The increase in frequency and intensity of these heatwaves in recent years has been attributed to global warming. It is necessary to predict these extreme events in advance to take appropriate mitigation activities. The accurate and sufficient lead time predictions of heatwaves will be beneficial for the society. In this study we have developed three different types of models using Artificial Intelligence (AI)/Machine Learning (ML) (CNN, LSTM, Random Forest) tools to predict heatwaves. With the help of these models, the prediction of heatwaves over two regions are developed (North and Central India, East Coast region in India). Based on correlation between predictors five influencing parameters/variables are selected as input to the models, by using these variables three models are developed and run over period 1952-2020, the data from 1952-2006 used to train models and remaining period used to estimate the model skill in predicting the heatwave events. The results revealed that among three AI & ML models Random Forest has shown promising results compared to other models (CNN, LSTM) with robustness of the developed models. We have also compared our AI model result with NWP (WRF) model predictions, results shows that AI model shown reliable forecast over WRF model.