**Seminar 2024-25**

**Topic:** Deep Learning Techniques for Detection

and Prediction of Pandemic Diseases

**Abstract**

Global pandemics have emphasized the crucial need for novel technology to improve infectious disease detection and prediction. Deep learning (DL) has shown great promise in healthcare applications, with the ability to improve pandemic preparedness by evaluating big datasets and identifying critical trends. This work conducts a systematic evaluation of existing deep learning algorithms used for pandemic disease detection and prediction, with the goal of assessing their performance while emphasizing important problems and areas for development. The review includes 45 research papers chosen from a larger pool of 790 articles sourced from databases such as Scopus and Web of Science. While deep learning models are successful in detecting and forecasting pandemics, they have substantial drawbacks, such as computational difficulties, incorrect data labelling, and a scarcity of high-quality datasets. These limitations affect the accuracy and scalability of current models. Despite these problems, the findings show that DL has the potential to transform pandemic detection if these constraints are overcome. Future research should focus on improving data quality, lowering computing overhead, and creating more optimized DL architectures for real-world applications. This would make deep learning systems more scalable and effective in supporting global health responses to future pandemics.

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Prof. Kuldeep A. Hule

**Submitted By:**

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Navjot Singh

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