

## Abstract:

Artificial intelligence (AI), particularly deep learning, has lately allowed extraordinary advancements within the biotech industry. Classifying objects, such as cancerous tumors, in images is one of the fundamental challenges that deep neural networks can handle. This project explores the classification of biofilm formation using deep learning object classification algorithms. The presence of biofilm facilitates the development of infections by compromising a patient's immune system and contributing to the failure of antibiotic therapy, which results in reoccurring infections and the emergence of multiresistant pathogens.

The traditional methods of biofilm detection, for example, Tissue Culture Plate, Tube method, bioluminescent assay, are tedious, costly and time-consuming. To overcome these limitations, we deployed an automated AI-based deep learning approaches, such as Convolutional Neural Networks (CNN), to identify biofilm formation. Our results show that the VGG-CNN model with transfer learning performs the best with an accuracy of 92.47%.