ABSTRACTS

The variety of Foraminifera fossils, classified as microfossils, serve as important indicators of environmental change. The high complexity of foraminifera fossil morphology often leads to subjective interpretations in manual classification processes. Additionally, the high genetic variability within a single species further complicates the classification process.

It is crucial for environmental observers to identify these fossil types accurately, as they are essential for reconstruction of geological history, determining the relative ages of rock layers, and understanding the depositional environments of past paleo-environments.

To improve identification, various approaches are needed to recognize subtle and complex features. This study utilizes the concept of transfer *learning* with the CNN (Convolutional Neural Network) method to expedite the *training* process, enhance accuracy, and reduce classification errors. The system developed employs ResNet50 and EfficientNetB0 architectures, with input data consisting of images of 18 foraminifera classes.

In this case, the evolutionary forms of foraminifera present a significant challenge for classification, especially with an imbalanced dataset. Despite several attempts, the *testing* results remained unsatisfactory. The best model achieved an accuracy of 85% during *training* but only managed to obtain an average F1 Score of 21% for the test data classification results.