

ARTIFICIAL INTELLIGENCE DEVELOPMENT
DIGITAL NATURALIST - AI ENABLED TOOL FOR BIODIVERSITY RESEARCHERS

LITERATURE SURVEY

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ABSTRACT :

Biodiversity plays an important role in the tropical ecosystem. Many forests have been uprooted by the plantations as they promise better and more yields. These conversions have a bad impact on the overall ecosystem as many of the species in the original forest have gone during the process. How much species still exists on the plantation or certain fields? This is a major issue in order to determine the species diversity of the plantation or field.

The biodiversity can be measured using different methods, such as counting the number of individuals or even families in a given area. Due to the size of the field, an automated process could be a great help to produce those metrics. This paper presents algorithms for species classification. The algorithms show a positive result, where the precision of 61%, (the system was trained using a sparse dataset) could be improved after increasing the dataset.

In the preliminary stage, the systems were trained using a few species only using conventional neural networks to check the feasibility and challenges. Furthermore, more species may be included in the training sets and the algorithm may be used to detect the species in real-time. For the purpose of getting the species diversity index, having an algorithm that could determine the number of different species on the data-sets would be enough.

The system does not need to tell the name of the particular species in detail. The final result is not only available for the tropical ecosystem but also an ecosystem where the species diversity index of the plants needs to be evaluated. Along with this neural network, there have also been algorithms developed using Open CV library in Python to extract the number of individual plants in a picture with an accuracy of above 80%. The algorithm uses hue, saturation, value extraction. and image segmentation from the

image to determine the number of plants. The result provides solid findings for further development of the algorithms to be deployed in real-time in integration with drones or field robots.

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