**Project Report**

**Building a Bird Classification Model Using Convolutional Neural Network**

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**Background:**

The project aims to develop a bird classification model using Convolutional Neural Network (CNN). With the increase in the usage of technology in ecological studies, identifying bird species from images has become an essential task. The bird classification model can help in identifying bird species more accurately and efficiently.

**Method:**

The algorithm used in the project is a Convolutional Neural Network. CNN is widely used in image classification tasks because of its ability to extract features from images. In the project, the CNN has four convolutional layers followed by three fully connected layers. The convolutional layers extract features from the input images, and the fully connected layers help in making predictions based on those features.

**Experiments:**

Experiments: The CUB-200-2011 dataset, which contains 11,788 photos of 200 bird species, was used in the project. The dataset is divided into training and validation datasets in an 80:20 ratio. Transforms such as random horizontal flip, random rotation, scaling, and tensor conversion are used to preprocess the photos. For ten eras, the CNN model is trained on the training dataset using the Adam optimizer and Cross-Entropy loss function.

Each era's training accuracy and loss are recorded. The accuracy of the model is calculated when its performance is tested on the validation dataset. On the validation dataset, the model had an accuracy of 76.78%.

**Contributions:**

Contributions: The project was finished by Berkay and Talha, who both contributed equally to its creation. Both were in charge of conceptualizing the project, planning and implementing its many components, as well as testing and debugging the final product.

**Conclusion:**

The Convolutional Neural Network-based bird classification model can help identify bird species more accurately and effectively. The accuracy of the model can be increased by utilizing a larger dataset.