Convolutional Neural Network Based Approach for Identification of Black Ruby Barb

LLG Chathuranga[1*], KAA Chathuragi[2] and RMKT Rathnayaka[3]
[1]Department of Computer Science, Faculty of Science, University of Ruhuna, Sri Lanka
[2]Department of Computing & Information Systems, Faculty of Applied Sciences,
Sabaragamuwa University of Sri Lanka, Sri Lanka
[3]Department of Physical Sciences & Technology, Faculty of Applied Sciences,
Sabaragamuwa University of Sri Lanka, Sri Lanka
[*]gihan@dcs.ruh.ac.lk

The basis for all aspects of taxonomic research is to identify the species accurately. So, Biologists are searching for more efficient methods to achieve the identification demand. Among the rapid increase in biological image data and the induction of artificial intelligence, modern machine learning techniques such as deep learning, plays a vital role in automated species identification. Such species are birds, snakes, fungus, frogs, fishes and etc. Traditional approach of fish species identification is expert based. It is time consuming. And also it tends to make errors for those who are not expert in that field and when the size of the sample is increased. In this paper we propose a Convolutional Neural Network (CNN) based fish identification method to identify the Sri Lankan endemic fish species namely Black Ruby Barb (*Puntius nigrofasciatus*). The training dataset consists photos taken from natural environment and images from the Internet. Since image dataset of Black Ruby Barb is not easily available, we used data augmentation transformation to generate more learning samples. The CNN model was trained by using 90% of labeled images and tested by using 10% of labeled images from the total dataset which contains images of Black Ruby Barb in various poses, rotations, and scales. The obtained results show that our approach achieved 89% accuracy and 79% accuracy for training and testing phases respectively. The proposed CNN based method has a promising performance for identification of Black Ruby Barb and has the potential to be extended to other fish species

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