Bird recognition

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Birds play an important role in a wide variety of ecosystems as both predator and prey, in controlling insect populations, pollinating and seed dispersal for many plants, and in releasing nutrients on to land and sea in the form of guano. From a scientific perspective it is therefore crucial to monitor bird populations. Now, research published in the International Journal of Computer Applications in Technology could pave the way to an automated bird identification system based on bird calls and song.

Arti Bang and Priti Rege of the College of Engineering, in Pune, India, explain that bird songs and calls are made up of syllables and each call and song unique to a given species consists of a group of syllables which in turn are made up of elements. It is possible to carry out a spectrographic analysis of the sound, but this is laborious and requires experts with a good ear for the sounds birds make. Ultimately, however, such an approach will be subjective when it comes to distinguishing between birds with very similar sounding calls and songs.

The team suggests that automated bird recognition based on recordings of the sounds the birds make is a pattern recognition problem. As such, they have developed an automated system that circumvents the problems associated with previous attempts to automate the process and is based on extracting syllables with 10-millisecond audio frames. The analysis then builds on techniques that have been used to extract information, such as tempo, key signature, and genre from recordings of music.

The team tested the algorithm developed from the study on samples of bird songs and calls from the comprehensive and well-known

international database Xeno Canto. They did preliminary testing of the system on with classification of ten bird species native to India carried out using Gaussian Mixture Modelling (GMM) and Support Vector Machines (SVMs). The same approach could equally be applied to species found anywhere in the world. Redundancy reduction within the system allows them to cut down the effects of background noise in any given audio recording and so improve accuracy still further.

More information: Arti V. Bang et al. Evaluation of various feature sets and feature selection towards automatic recognition of bird species, *International Journal of Computer Applications in Technology* (2017). DOI: 10.1504/IJCAT.2017.088197

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