

Audio Diarization for Biodiversity Monitoring

Ciira wa Maina

Department of Electrical and Electronic Engineering

Dedan Kimathi University of Technology

Nyeri, Kenya

Email: ciira.maina@dkut.ac.ke

Abstract—Biodiversity monitoring is important in assessing the state of an ecosystem and determining if conservation actions are required. This is particularly important when conservation resources are scarce. However, traditional methods of biodiversity monitoring are labour intensive and cannot be applied in every ecosystem where there is need. In order to expand the application of biodiversity monitoring, there is need to automate this important task. In this work we present an application of audio diarization methods for biodiversity monitoring and show how these methods can be used to measure the abundance of indicator taxa in areas of interest. The use of audio recordings has the potential to reduce the time and effort spent in biodiversity monitoring. The experiments are performed on a freely available dataset of bird song recordings with the birds serving as indicator taxa in the ecosystem of interest. We are able to estimate the number of bird species in the recordings and this information

entropy of audio recordings obtained in the wild and to associate the entropy with the number of species present in a recording. A number of studies have shown that the entropy of a recording is correlated to the number of species present in that recording [5].

In addition to measuring the entropy of recordings for biodiversity monitoring, acoustic recordings can be used to survey indicator taxa when these indicator taxa produce vocalizations. It has been shown that birds can serve as indicator taxa and since most birds produce vocalizations, audio recordings of bird species can be used to determine the biodiversity where these recordings are obtained. By integrating technology used to identify bird species from their recordings and methods for counting the number of individuals in a recording, systems that