

REPORT

On: Interspeech, September 8th-12th, 2016.

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1. Current research activity (*approx. 300 words*)

Describe briefly the subject of your current research, the framework in which this research is being carried out (Ph.D. thesis, project, etc.) and its stage (the time you have already dedicated to this work, expected time needed to be accomplished).

My current research work involves developing methodology for the application of bioacoustic approaches to biodiversity monitoring. The project is titled the Kenya Bioacoustics Project and it involves design of low cost devices for acoustic monitoring, development and testing of signal processing and machine learning techniques to automatically detect bird species from the recorded audio and collaboration with ecologists to validate the results of the automated approaches to biodiversity monitoring. This project began in 2015 and is expected to continue for five more years.

2. Benefits derived for your research from attending the conference

Please give the following information: (approx. 500 words)

- Title, session and abstract of your paper.
- Questions raised or remarks made on your paper which could be beneficial for your work.
- Papers dealing with the same or similar subject which you deem most important for your work.

At Interspeech 2016 I presented a paper titled “Cost Effective Acoustic Monitoring of Bird Species” during the special session on Speech, Audio, and Language Processing Techniques Applied to Bird and Animal Vocalizations

Abstract

Climate change and human encroachment are some of the major threats facing several natural ecosystems around the world. To ensure the protection of ecosystems under threat, it is important to monitor the biodiversity within these ecosystems to determine when conservation efforts are necessary. For this to be achieved, technologies that allow large areas to be monitored in a cost effective manner are essential. In this work we investigate the use of acoustic recordings obtained using a low cost Raspberry Pi based recorder to monitor the Hartlaub's Turaco in central Kenya. This species is

endemic to East Africa and faces habitat loss due to climate change. Using simple features derived from the spectrograms of the recordings, a Gaussian mixture model classifier is able to accurately screen large data sets for presence of the Hartlaub's Turaco call. In addition, we present a method based on musical note onset detection to determine the number of calls within a recording.

Questions and comments raised

- 1) The possibility of extending this work by use of multiple microphones to allow distance estimation was mentioned.
- 2) A visitor to my poster suggested the investigation of deep learning approaches.
- 3) The possibility of using the data set associated with the paper in future bird and acoustic scene classification competitions was also raised.

A number of papers at the special session on bird and animal vocalizations provide useful ideas for future work. In particular, the paper “Feature Learning and Automatic Segmentation for Dolphin Communication Analysis” by Daniel Kohlsdorf et al. Explores the automated extraction of features from audio recordings. Also , the paper “Localizing Bird Songs Using an Open Source Robot Audition System with a Microphone Array” by Reiji Suzuki et al. explores distance estimation using low cost components.

3. Personal highlight of the conference (*approx. 100 words*)

Please report the most remarkable to you finding of the conference

The Interspeech conference was well organised and there were several personal highlights. First, I was able to meet with Prof. Shrikanth Narayanan, a collaborator on the Kenya Bioacoustics Project, in person. Second, the special session on bird and animal vocalizations was a great experience. The work presented was of high quality and inspired me to continue my work in the area. In addition, I met a number of potential future collaborators. Third, the keynote talks were very interesting. I particularly enjoyed the keynote by ISCA medallist, John Makhoul, who shared lessons learnt from his long and distinguished career. These included the importance of mathematical models and having fun!

This short report could be published on ISCA’s website.