



PhD Title: **Birdsong Forensics for Species Identification and Separation**

Studentship: **Full Scholarship, including fees (EU/Non EU) plus annual stipend of €16,000.**

Start Date: **Sept 2nd, 2013**

PhD Supervisor: **Dr. Naomi Harte,
Sigmedia Group, Electronic & Electrical Engineering,
Trinity College Dublin, Ireland**

Collaborator: **Dr. Nicola Marples,
Zoology,
Trinity College Dublin, Ireland.**

Background:

The analysis of birdsong has increased in the speech processing community in the past 5 years. Much of the reported research has concentrated on the identification of bird species from their songs or calls. Smartphone apps have been developed that claim to automatically identify a bird species from a live recording taken by the user. A lesser reported topic is the analysis of birdsongs from subspecies of the *same* bird. Among experts, bird song is considered a particularly effective way of comparing birds at species level. Differences in song may help uncover cryptic species. In many species, such as those living in the high canopy, catching the birds in order to obtain morphological (e.g. weight, bill length, wing length etc.) and genetic data may be time consuming and expensive. Identifying potentially interesting populations by the detection of song differences, allows any such effort to be better targeted.

Birdsong presents many unique challenges as a signal. The use of signal processing and machine learning techniques for birdsong analysis is at a very early stage within the ornithological research community. This PhD project seeks to lead the way in defining the state of the art for forensic birdsong analysis. Comparing birdsongs will push out the boundaries of feature analysis and classification techniques in signal processing. The research will develop new algorithms to systematically quantify levels of similarity in birdsong, transforming the comparison of birdsong in the natural sciences arena. The results will be of importance internationally for the study, monitoring, and conservation of bird populations.

Requirements:

The ideal candidate for this position will:

- Have a primary degree (first class honours) in Electronic Engineering, Electronic and Computer Engineering or a closely related discipline.
- Possess strong written and oral communication skills in English.
- Have a strong background and interest in digital signal processing (DSP)
- Be mathematically minded, and be curious about nature.



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Experience in Matlab is a distinct advantage.

Application:

Interested candidates should send an email to Dr. Naomi Harte at nharte@tcd.ie. The email **MUST** include the following:

- Candidate CV (max 2 pages)
- A short statement of motivation (half page)
- Scanned academic transcripts
- Name and contact details for TWO academic referees

Incomplete applications may not be considered.

About the Sigmedia Group at TCD

Dr. Naomi Harte is an expert in Human Speech Communication. Her principal areas of focus are audio visual speech processing, speaker verification for biometrics and forensics, emotion in speech, speech processing in hearing aids and speech quality.

She is a leader of the Sigmedia Group at TCD (www.sigmedia.tv) within the School of Engineering. Over the past 5 years, Sigmedia has been awarded research income of over €3million and published 73 peer reviewed papers. The group currently has 3 academic and 3 post-doctoral staff along with 12 research students. The work of Sigmedia is supported by research grants from Science Foundation Ireland, Enterprise Ireland, Irish Research Council, Google and DTS.