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Since the beginning of Music Information Retrieval (MIR) as a field, most of its models and technologies have been developed for mainstream popular music in the so-called 'Western' tradition. Over the last few years, there has been an increasing interest in applying available techniques to the study of traditional, folk or ethnic music. Ethnomusicologists, music theorists and practitioners, among others, could considerably benefit from this research. Although computational techniques have been proved to be of great interest when applied to different musical repertoires, it is apparent that we need to develop culture-specific techniques and algorithms to understand, model, and process different music repertoires.

The name of *Computational Ethnomusicology* can be as old as 34 years at least (Halmos et al. 1978). Halmos et al. (1978), two mathematicians and an engineer, provide an interesting discussion about the role of computers in the main five areas of research in ethnomusicology: data collection, administration, notation, selection and systematization, and scientific treatment. According to them, computers cannot be used for collecting data, as field work and personal meeting with informers is an integral part of data gathering. In addition, in the area of scientific treatment the computer might be equally limited, as they might not understand human and historical behaviours expressed in the data. However, they explore the use of computers for research-administration, notation, selection and systematization from three groups of data: melodies (the study involves 10,000 melodies), registrations and social conditions. We see that, although these principles and usages of computers are still valid today, computational models can also be used to collect data in the field, or to compute models of social interaction that is based on complex networks science.

The term was recently re-defined by Tzanetakis et al. (2007) as 'the design, development and usage of computer tools that have the potential to assist in ethnomusicological research'. Under this view there is a main discipline, *Ethnomusicology*, that takes advantage of advances in supportive disciplines such as Computer Science, Music Cognition or Cultural Studies and applies/tune them to their own problems. Even though this could be the most accepted and practiced view, and the papers we include here totally adhere to it, we would like to note that this is a restrictive definition of a discipline as tool-provider. Computer models can be 'theories' or 'hypotheses' (not just 'tools' as a spreadsheet or a statistical package can be) about processes and problems studied by traditional ethnomusicologists. When we approach *Computational Ethnomusicology* this way, we adopt a new mental framework that helps to restructure problems and perceive the relationships between their constitutive elements under a different perspective. We look forward in that the present special issue may help to step ahead towards such a procedural view of the computations required in the discipline.

As publications in the topic of Computational Ethnomusicology have been scattered among different journals, the goal of this special issue is to gather relevant, high-quality research on computational methods and applications in ethnomusicology. The papers included here deal with different musical facets such as pitch, pulse and tempo, and voice timbre. They address different musical repertoires, from Central-African to Basque folk music. They also cover a broad area: tools, including data collections, methodology and Ethnomusicology core-problems. It is noticeable that the latter category is barely represented. Maybe this could just be a side-effect of the journal hosting the call, a bias induced by the invited editors and reviewers, or maybe an indication (or confirmation) that the field is still very young. In that case, it is clear that there first needs to be procedural recipes and computational weapons that give us the power to address all the open problems.

The paper titled *Tarsos, a Modular Platform for precise Pitch Analysis of Western and non-Western music*, by Joren Six et al., presents a tool for automatic pitch content description of music signals conceived to cope with different music traditions. Pitch-content information is in the core of melody, tuning, scale and tonality characterization. The Tarsos platform integrates several state-of-the-art pitch estimation algorithms and provides different visualization facilities, e.g. pitch estimations, pitch and pitch-class histograms (related to the used scale) and histogram peaks, representative of the main intervals. The tool also provides input/output and scripting capabilities. The authors show some examples of the use of Tarsos for different analysis tasks in non-Western music, focusing on problematic issues such as the integration or comparison of different pitch estimation algorithms, music with pitch drift, and the analysis of large datasets (e.g. Makkam recognition). In this study, an important conclusion is that we can build generalized approaches for pitch distribution analysis that can go beyond elementary concepts of the Western music theoretical canon by avoiding music theoretical concepts. Although these tools are useful for low-level musical analysis, they would eventually need manual tuning and interpretation by experts on the specific repertoire under study.

The paper presented by Olmo Cornelis et al., entitled *Evaluation and recommendation of pulse and tempo annotation in ethnic music*, provides an analysis of how automated tempo estimation approaches perform within the frame of Central-African music. After a review of the concept of tempo and the issues associated with its formulation, the authors propose several tapping experiments involving human annotations, automatic beat tracking sequences and the comparison between them. Out of the results, several problems are discussed by the authors: (1) can the existing automatic beat trackers and tempo estimators be employed to extract tempo in Africa-Central music; (2) can those experiments shed light on the problem of ambiguity in tempo perception; (3) can problematic tempo cases be detected from the data collected; and (4) can the data provide insight into the problem of the existence of a higher metric level? This paper exemplifies clearly an earnest endeavour to apply computational ethnomusicology methods and tools to ethnic music without a Western standpoint in mind.

Locating and discovering information that is hidden in big databases of music data calls for carefully crafted interfaces. In *A location-tracking interface for ethnomusicological collections*, Michela Magas et al. have presented a dynamic GUI that combines graphical representations of ethnomusicological annotations with a content-based search of audio files coming from the Cantometrics Training Tapes dataset. A distinctive and remarkable feature of the system is the usage of maps that directly leverage geographically-based comparisons and reasoning. The system provides a friendly and non-expert entry-point to Alan Lomax's highly appreciated collection but, at the same time (and according to the evaluation that is presented here), it makes possible to pose and answer proficient ethnomusicological questions and to reveal cross-cultural similarities and differences.

The paper by Darrel Conklin et al., *Antipattern discovery in folk tunes*, focuses on one of the current research problems and challenges in the area: the discovery of patterns as a way to characterize different repertoires. Unlike other studies in the literature, this paper focuses on the discovery of rare patterns and analyses the significance of its exceptionality, even its absence, among those patterns that are frequent in a background set. The method proposed by the authors includes the connection of the discovered patterns to a background ontology of folk tune genres. The method is tested on a large corpus of Basque folk tunes. Results are discussed in the paper, including assessment of antipattern discovery, the ambiguity of certain data contained in the ontology, and the difficulty of interpreting the results of descriptive data mining due to the lack of a clear performance measure.

Phonation modes impart differential acoustic features to the sound of the singing voice. Detecting such modes becomes, then, an interesting and challenging way to describe singing voices and, by extension, singing styles. Polina Proutskova et al. provide in *Breathy, Resonant, Pressed – Automatic Detection of Phonation Mode From Audio Recordings of Singing* a three-fold contribution: on one side they have recorded, annotated and given access to a systematic dataset of phonation modes (by a single singer, though); in addition, they advance an automatic detection model for the four modes (breathy, neutral, flow, pressed) included in the dataset; to conclude, the authors advance some debatable ideas on the possible relationships between phonation modes in singing and the status of women in society for which, indeed, more and better data, should be gathered and analysed.

The papers in the Special Issue provide the reader with a comprehensive perspective on the status of the field of *Computational Ethnomusicology* and confirm the interest of combining traditional and computational methodologies for the study of different music cultures. We hope that this special issue may serve as an introduction to the field for those JNMR readers that are not familiar, but interested, in it, and to call attention to the vastness of musical problems that lie beyond the nearly invisible mental frontiers that our musical native culture has tacitly raised in front of us.

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