***Music in Motion*. The Automated Transcription for Indian Music (AUTRIM).** NCPA and UvA. Website. http://autrimncpa.wordpress.com

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Translation from the original French by Apple Translate in Safari. which was corrected by Wim van der Meer.

In the field of Indian studies, musicological work that offered complete and very precise transcriptions of North Indian *raga* interpretation [1] by a Western notation system has shown how useful it is to notate an interpretation: there are many notes that can be written but yet something else is happening. It is from this insight that we were able to go beyond a solfegic writing and take up the questions of writing formulated by Jack Goody (*La raison graphique,* 1979) to work on this "other thing" that multimedia tools allow us today to explore by challenging the traditional questions of the transition "from a continuous sound flow to a solfegic written form" (Estival and Clair 1997: 40).
Indianist researchers Wim van der Meer [2] and Suvarnalata Rao [3] have worked together for many years on the development of computer tools [4] in particular to compare the analysis of the "real" pitches of an oscillation (*gamak*) with the "aural" perception of the musician (their research mainly concerns vocal music in the Hindustani tradition). This work was the result of a team project that the International Society for Traditional Arts Research (ISTAR) begun in the 1980s in New Delhi under the impetus of young European and Indian researchers and musicians: "[the] dream was to develop a system of notation that would be specifically fit to describe, analyze and even reproduce Indian music with all its fine nuances and inflections". The result of three decades of work gave rise to the AUTRIM (AUtomatic TRanscription for Indian Music) project: a tool that allows the synchronization of melodic curves (made using Praat software) and sound in its temporal development [5]. Presented at the *Sangeet Research Academy's* annual meeting in January 2010 in Mumbai, the project, online since January 2013 (*Music in Motion*), provides access to commented transcriptions of dozens of *ragas* performed by great singers who have lent themselves to the experiment [6]. Developed and designed for the use of music students, teachers and researchers, the site offers an entry by *raga* (86 for the moment) or by artist (eleven singers in the

Khayal and Dhrupad styles [7]) and provides a glossary of Hindustani musical terms, information on the organization of a performance, a description of the main genres, concepts and theories relating to the Hindu tradition as well as a bibliography that lists the main references to theories and classifications in ancient literature and current encyclopedias.

Each page dedicated to a *raga* follows the model proposed in the *Raga Guide* (1999), giving some keys to the history, theory and specific characteristics of the interpreted *raga*, augmented by a list of recommended (untranscribed) recordings often accompanied by a link that allows you to listen directly online to the indicated reference. The unlimited space of the digital format offers the advantage of hearing several interpretations of the same *raga* whose full transcripts are integrated into videos. Each transcribed recording is accompanied by a text that provides the transcription in Devanagari of the poem sung and translated into English with an explanatory note on the origin of the poem and the context in which it was composed when the author is known. Finally, a brief analysis describes the important stages of performance (exploration of a register, beginning of composition, change of tempo) or highlights a remarkable event (characteristic melodic movement, significant ornament, unusual or sensative use of a phrase or note). We can hear (and see) for example two interpretations of the *Deshi raga* (by singer Ram Deshpande and singer Manjiri Asanare) in the Khayal genre and appreciate the subtle variations between these two interpretations of the same poem, which are fundamental elements in the differentiation of styles (difference in rhythmic structure within the same cycle, tempo variations, proportion of parts, hierarchies between notes). Unlike the recordings made for the *Raga Guide*, there was no time constraint on the musicians of the AUTRIM project, a particularly important aspect that compensates for the more experimental (less "authentic") dimension of the performance context implied by the protocol and the recording context. Finally, one of the great contributions of this platform to the *Raga Guide* is of course the multimedia dimension that offers to see and hear the *raga* simultaneously in its complexity: the video file screen is divided into two parallel panels, the first giving a global view of the melodic contour and the second (two-thirds of the screen) a zoom on each developed sentence, transcribed using Praat software.

Originally designed for the analysis of spoken voice, Praat (Dutch: "talk") was created by researchers Paul Boersma and David Weenink of the University of

Amsterdam in the Department of Phonetics [8]. Musicologists have found this a tool of great precision to represent the melodic contours and calculate the pitches and durations of a musical piece. Particularly relevant in the analysis of Hindustani music, it meets specific needs to account for this "other thing" that makes all the subtlety of this music: to represent the approaching movement of a note (the attack), to detect hyphenation and *glissandi* between two notes, to calculate the pitches reached within an oscillation (*gamak*, *andolan*) or in a very fast movement (*murki, kan*) and to compare melodic contours by superimposition. The quality of the melodic transcription made using the software offered on the AUTRIM website is particularly appreciable for the accuracy of the drawing thanks to recordings made in the studio under optimal conditions for computer processing: the use of directional microphones made it possible to separate the tracks and thus to remove the generally significant interference due to accompanying instruments (in particular *tanpura* and harmonium). We will particularly appreciate the interpretation of the *raga Darbari Kanada* by Dhrupad singer Uday Bhawalkar whose finesse of the particularly slow and deep slides (*mind*) in this raga is virtually sublimated by the transcription (on the Pa\ dha movement between 2'27 and 2'35). Finally, one of the aspects on which the team wanted to evolve the first tests of the protocol was to synchronize the movement of the graph with that of the sound stream: it is no longer just a cursor that moves on a static graph but rather a "music in motion", as indicated by the name given to the project ("Music in motion") [9]. For all these points (quality of presentation, accessibility, quantity of interpretations, finesse of analysis) the AUTRIM project marks a stage in Indic studies on music that will very quickly become a reference in the same way as the *Raga Guide*. Designed primarily for Indic researchers and musicians who practice Hindustani music, it is both the strength and weakness of this tool: the choice of Indian notation (*sargam*) to indicate the name of notes makes it more difficult for the uninitiated to read while a double notation (Indian and Western) would have made it easier for them to find their way around (especially since software has all the features to do so) [10]. Finally, it is regrettable that the project does not make these working tools available to allow students and researchers to continue to enrich the transcription collection themselves and to explore ways to improve the protocol. Meetings and workshops around the various technological advances in digital musicology should be encouraged to intersect skills and help publicize work as remarkable as that of AUTRIM. Similarly, it is hoped that this platform will be

used by musicians and musicologists specialized in other fields and that it will inspire new initiatives.

NOTES

Review appeared in: MUSICultures, 41(1). Retrieved from https://journals.lib.unb.ca/index.php/MC/article/view/22365

1. In particular, the work of researchers Neil Sorrell (1980), Stephen Slawek (1987), Richard Widdess (1994).
2. Musicologist, teacher at the University of Amsterdam, executive director of the *Journal of the Indian Musicological Society*.
3. Musicologist, Director of the Indian Music Programming Department at the National Centre for Performing Arts (NCPA, Mumbai).
4. In the tradition of Charles Seeger and the invention of the *melograph* (1951: page?)
5. http://autrimncpa.wordpress.com/
6. The video assembly was made by Rustom Irani and Salil P. Kawli. The project was made possible and made public thanks to the financial support of the Dorabji Tata Trust and the support of the NCPA (National Centre for Performing Arts) and the University of Amsterdam.
7. Ajoy Chakrabarty, Ashwini Bhide Deshpande, Aslam Hussein Khan, Jayateerth Mevundi, Manjiri Asanare Kelkar, Mashkoor Ali Khan, Padma Talwalkar, Ram Deshpande, Uday Bhawalkar, Ulhas Kashalkar, Veena Sahasrabuddhe.
8. http://www.fon.hum.uva.nl/praat/
9. The EAnalysis software developed by Pierre Couprie offers the choice in video export between the two systems (when entering the export parameters, the "continuous scrolling" option allows you to set the graph in motion).
10. The authors say they are addressing a wide audience not specialized in Indian music, unlike, for example, the colossal transcription work carried out by Nicolas Magriel (2013), who claims an Indian transcription for the Indians.

REFERENCES

Bor, Joep. 1999. *The Raga guide*. Rotterdam: Nimbus record and the Rotterdam Conservatory of Music.

Summer, Jean-Pierre and Jйrфme Cler. 1997. "Structural, movement, graphic reason". *Traditional Music Notebooks* 10: 40.

Goody, Jack. 1979. *The graphic reason, the domestication of wild thought*. Paris: Éditions de Minuit [1977, *The Domestication of the Wild Mind*, Cambridge].

Magriel, Nicolas. 2013. *The Song of Khyal*. Delhi: Manohar.

Seeger, Charles. 1951. "An instant music notator". *The Journal of the International Folk Council* 3: 103-106.

Slawek, Steven. 1987. *Sitar Technique in Nibadh Forms*. Delhi: Motilal Banarsidass.

Sorrell, Neil and Ram Narayan. 1980.

Indian Music in Performance, a practical introduction, Manchester: Manchester University Press.

Widdess, Richard. 1994. "Involving the performer in transcription and analysis: a collaborative approach to dhrupad". *Ethnomusicology* 38 (1): 59-79.