

geometry of an instrument may affect the generated sound. Using the Finite Element Method, it is possible to systematically vary some of the geometrical properties of an instrument while observing how certain modifications may result in differences in the behaviour of the instrument. Considering the reconstruction of a Rabab, the focus of this work lies in the response of the instrument when excited at different frequencies. In particular, various hole configurations (on the top plate, the ribs and the bottom of the instrument) as well as two different bridge orientations are considered. Based on the numerical simulations, an oblique bridge seems to offer a stronger support in comparison to a straight bridge, for a broad frequency range. On the other hand, different hole configurations may offer advantages and disadvantages at different frequency bands. In order to validate the accuracy of the simulations, the input admittance is measured at the bridge of a real instrument and compared to a calculated input admittance based on numerical simulations.

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Leonardo Medina (University of Aveiro) &
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The Brazilian *Rabeca*-Diversity and the *Orocongo*. The Collaboration Process for the Making of an 'Other' Musical Instrument Based on Two Traditions

The *rabeca* is an instrument that arrived in Brazil during the early days of colonization, currently undergoing a revival process in which players, builders, researchers and enthusiasts form a “community of practice” (Lave & Wenger 1991). Within this community, there is a permanent and fluid exchange of information between its actors, which allows many interpreters to be builders and vice versa, and where there is a consensus that there is not an only type of *rabeca*, with an ideal and crystallized pattern. On the contrary, it presents a multiple diversity in terms of shape, size, materials used, tuning, number of strings, ways of playing and repertoires, always privileging the practical result over conventions and standards, and superimposing ‘the customer's taste’ to crystallization and standards.

Based on this diversity and our experience, researches and fieldwork this includes – in addition to interviews, organization and participation in knowledge meetings, presentations playing the *rabeca* with different players – the collaborative construction of similar instruments, one bigger, called *rabecão*, and another based in the afro-brazilian *orocongo*.

The *orocongo* is a skin-covered bowed string instrument which has only one string. Its body is commonly made with the shell of the coconut or calabash, and the neck of wood. Each *orocongo* is unique, as it has a different tuning due to the way and size and manufacture.

In that way, we thought of making an 'other' instrument based on the *orocongo* with the differences of being bigger, with two strings and a lower tuning in order to accompany the *rabeca* in its different repertoires. Therefore, in this paper, we will explain the process and present the design, manufacture, sound and possibilities of this 'other' instrument, conceived and manufactured in a collaboration process.

Leonardo Medina is an Argentinian researcher, bass player, cellist, arranger, conductor and teacher. Master in Ethnomusicology from the Federal University of Paraíba, Specialist in Music Education and Cello Technician from the Federal University of Rio Grande do Norte, both in Brazil, and a Bachelor's Degree in Music from the Universidad Nacional de Cuyo in Argentina. He has experience as a musician in several symphony orchestras and music groups in various genres and as a teacher in educative orchestral social projects. His expertise as a researcher ranges from performative ethnomusicological research and musical instruments to music education, with a focus on Latin American music and music on transit along the Atlantic corridor in its various forms of transmission and exchange of knowledge, whether oral or written. He currently plays and coordinates groups of forró and world music and is developing a PhD research on the Brazilian *rabeca* at the University of Aveiro in Portugal.

João Nicodemos Araújo is a Brazilian constructor, player, teacher and researcher of *rabecas* and *marimbaus* for more than 20 years. Being a visual artist with more than 130 video productions and ethnomusicologist, he published the book *The Build of Rabeca – Idiosyncrasies of Master Antônio Merengue*. He is a specialist in Visual Arts by the SENAC, Master in Music in Ethnomusicology from Federal University of Paraíba and traditional poetry cordelista enrolled in the Academy of Cordelistas of Crato.

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***Cobuz cumanicus*. Reconstruction of the Instrument**

The Cumans, also known as Kipchaks and Polovtsians, were a nomadic Turkic people living in West Eurasian steppes in eleventh–fourteenth centuries. Their main musical instrument, *cobuz*, is known from written sources, rare images, and archeological artifacts. Its traces could be found in several folk traditions of the region. And its related instruments include the Turkish *kopuz*, the Arabic *qanbus* (and its descendants), the European *rabab* and many others, both bowed and plucked. Two Kipchak *cobuzes* (thirteenth–fourteenth centuries) known from archeological sites in modern day Ukraine and Russia were a subject for a reconstruction by different authors but due to lacking details, the results were ambiguous. Moreover, the *cobuz* is still relatively unknown to the public and other researchers.

The paper proposes new detailed reconstructions based on a comparison to a wide range of instruments. In addition, it presents 3D models of two reconstructed instruments which would help other researchers and luthiers. Another purpose for this