

# Spaces sing, are you listening?

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We present *Soniferous Resonances*, an ongoing collection of electroacoustic composition pieces that intersect music, digital technologies and architecture. The creative impetus supporting this research is grounded in the interchange of the following two concepts: 1) the phenomenological exploration of the aural architecture [1], particularly the reverberation as a sonic effect [2] through music performance and 2) the real time sound analysis of both the performance and the reverberation (i.e. impulse responses) intervallic content — which ultimately leads to a generic control over consonance/dissonance (C/D). Their conceptual and morphological nature can be understood as sonic improvisations where the interaction of sound producing bodies (e.g. saxophone) with the real (e.g. performance space) and the imaginary (i.e. computer) acoustic response of a space results in formal elements mirroring their physical surroundings.

Particular emphasis is given to spectromorphological manipulations by a large array of “contrasting” digital reverberations with extended control over the sound mass [3] and its musical interval content across a continuum between pitched and consonant to unpitched and dissonant sounds. Two digital applications developed by the authors are seminal in *Soniferous Resonances*: Wallace [4] and MusikVerb [5]. The first is a navigable user-control surface that offers a fluid manipulation of audio signals to be convolved with several “contrasting” digital reverberations. The second offers refined (compositional) control over the interval content and/or C/D levels computed from the perceptually-inspired Tonal Interval Space [6] resulting in an automatically adaptation of harmonic content in real time.

*Soniferous Resonances* aims at pushing the boundaries of musical performances that are formally tied to its surrounding space, as well as triggering new concepts and greater awareness about the sublime qualities of experiencing aural architecture.

## References

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**Gilberto Bernardes** has a multifaceted activity as a saxophonist, new media artist, and researcher in sound and music computing. He performs mostly in Europe and the United States and has been published in many peer-reviewed scientific journals and international conferences. Gilberto Bernardes holds a PhD in digital media from the University of Porto (under the auspices of the University of Texas at Austin), a Master of Music from the Conservatory of Amsterdam, a Bachelor of Music from the Polytechnic Institute of Porto, and a Degree ("Premier Prix") in saxophone and chamber music from the ENM d'Issy-les-Moulineaux (Paris, France). Since 2007, he has developed a research activity in generative music systems through different projects, including in its most current position as a senior researcher at the Sound and Music Computing Group from INESC Technology and Science.

**Filipe Lopes** holds a PhD in Digital-Media from the University of Porto and he is a composer with strong affinities with electroacoustic music and new technologies. He has developed work in the area of electroacoustic music composition and multimedia installation, also collaborating in the scope of cinema, theatre or video installation. Currently, in addition to his creative and pedagogical work combining music and new technologies, he is a professor at the School of Media Arts and Design of the Polytechnic of Porto and a researcher at the Center for Research in Psychology and Music Education – Branch of Inet-Md.

**Clara Cardoso** holds a PhD awarded by Institute of Sound and Vibration Research, University of Southampton, U.K.. Clara has been an acoustic consultant for ten years in both Portuguese and the UK companies working in project coordination for a variety of architectural and environmental acoustic projects. Clara has been an acoustic consultant for a range of projects that include auditoriums, Schools, Residences, Offices, Stadia, Museums, Hospitals and Shopping Centres all over the U.K., Portugal, Brazil, Gibraltar, Russia and Azerbaijan. Clara has also participated in collaborative, industry driven research projects between Universities and acoustic consultancies. In addition Clara is a lecturer of Acoustics for the Sound Course at Restart School in Porto.