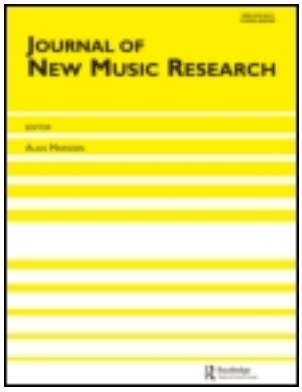

Journal of New Music Research
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/nnmr20

Preface: Special Issue on Creativity Rethinks Science

Federico Avanzini [a] , Giovanni De Poli [a] & Davide Rocchesso [b]
[a] University of Padova, Italy E-mail:
[b] Iuav University of Venice, Italy E-mail:

To cite this article: Federico Avanzini , Giovanni De Poli & Davide Rocchesso (2012): Preface: Special Issue on Creativity Rethinks Science, Journal of New Music Research, 41:4, 295-297

To link to this article: http://dx.doi.org/10.1080/09298215.2012.746375

Journal of New Music Research
2012, Vol. 41, No. 4, pp. 295–297

Routledge
Taylor & Francis Group

Preface: Special Issue on Creativity Rethinks Science

Creativity does not arise as a gift. It may emerge as a combination of expertise, craft, knowledge, and culture. Studies in creativity look at the nurturing conditions, at the context and ingredients that may trigger creative acts. As creativity is widely recognized as a key element in today's societal developments, the importance of such studies goes well beyond the domain of artistic expression. Scientists and technologists are being increasingly invested with the responsibility of modelling and understanding creative acts. The dialogue between art and science has never stopped through the centuries of human civilization, although the seemingly diverging languages and tools have often put the 'two cultures' at friction in the contemporary world. However, experimentation is a concept that is familiar both to scientists and artists, and it should be possible to identify and define a number of common frameworks that provide an appropriate interaction set for genuinely multidisciplinary research.

'Creativity rethinks science' was the main theme of the 8th edition of the Sound and Music Computing Conference (Zanolla, Avanzini, Canazza, & de Götzen, 2011). This yearly conference is the forum for international exchanges around the core topics of Sound and Music Computing (SMC). Emerging research trends related to SMC have led in recent years to several roadmapping projects aimed at defining it as a research field, through an assessment of the state-of-the-art, a vision of a medium-to-long term future, an outline of the scientific challenges and related strategies. Perhaps the most comprehensive of such roadmapping attempts is the one made in 2007 by a consortium of SMC reseachers in the context of the S2S[2] (Sound to Sense – Sense to Sound) European project. As a result, Sound and Music Computing was defined as a research field approaching the whole sound and music communication chain from a multidisciplinary point of view, and its context, aims, methodologies, and main challenges were identified (Bernardini & De Poli, 2007).

Given its multidisciplinary nature, SMC is a field where several existing unconventional creative environments are found, where research and art already collaborate in a productive way generating new ideas and concepts. These provide a fertile ground to analyse and try to understand artistic thinking as a driver of innovation, the relationship between artistic and scientific methodologies, and the processes that lead to successful artistic and scientific results. Artistic and creative thinking serves to generate solutions to complex problems where analytic and scientific thinking fails. Artistically motivated problems are 'wicked problems', and as such they defy standard problem solving methods, since neither the problem nor the solving methods are well defined: they call for creative solutions, which are counterintuitive and surprising, as they are generated through non-deterministic and 'non-darwinian' processes.[1] Scientists and engineers tend to advance knowledge through small, linear incremental steps. Artists on the other hand move through 'lateral steps', which sometimes allow them a better view beyond.

All the papers included in this special issue are based on original technical contributions to the 8th edition of the SMC Conference. Building on the fertile discussion that arose during the conference, they have been reworked and expanded with the goal of exploring more deeply our theme, each from a different perspective.

Two contributions focus on expressive musical performance, surely a creative act. The question arising from these articles is whether and to what extent can automatic music performance systems be said to be creative. Katayose, Hashida, De Poli and Hirata (2012)[2] review the experience of the Rencon Workshop, a contest for computer systems generating expressive musical performances. By assessing and evaluating the outcomes of such experience, the authors propose future perspectives for this field and for the use of this kind of contest in scientific research. The central issue here is the contrast between creativity (in music performance) regarded in terms of 'subjective effectiveness' and creativity as a result of intentionality, imagination, and skills.

[1]A reflection on this theme was provided by the SMC2011 Keynote Speaker, Roberto Casati, in his address 'Time is of the essence: creativity, symmetry, and counterintuitive solutions'. See http://smc2011.smcnetwork.org/programme.htm#keynote.
[2]This contribution was edited by Federico Avanzini and Davide Rocchesso.

http://dx.doi.org/10.1080/09298215.2012.746375

Related concepts are addressed in the second paper of this issue (Grachten & Widmer, 2012). The authors present a linear basis modelling framework for musical expression. Here, however, the interest is not only on the predictive value of the proposed model (i.e. its ability in music performance generation), but also on its use for explanatory purposes. Both these aspects are discussed through novel experimental results. The pragmatic view of the authors is that computational models for musical expression should not be seen as models of cognitive or creative processes, and that 'creativity is in the eye of the beholder'.

Marsden (2012) also explores the concept of creativity in the reception rather than in the generation of music, by focusing on melodic similarity. The article critically surveys the many different empirical bases used in studies of melodic similarity, and their implications in music information retrieval and query systems. Through the examination of data from the MIREX 2005 contest on melodic similarity, and the analysis of some cases of similarity in music by Mozart, the author shows that the perception of similarity is dependent on interpretation, and is to some extent something 'created' in the mind of the listener rather than a definite function of two melodies.

Melody recognition is the main topic of the paper by Koduri, Gulati, Rao and Serra (2012), although the focus here is on a rather unexplored domain for SMC research: rāga, the fundamental melodic framework of Carnatic and Hindustani music systems. The authors evaluate various computational approaches to rāga recognition, and particularly approaches based on pitch distribution methods. This work shows that a culture-specific perspective in computational musicology and music technology poses new research questions with respect to current western-centred paradigms. In this sense the multicultural nature of musical creativity helps rethinking scientific research challenges.

The three remaining contributions present three case studies that share an interest in the theme of individual and social interaction with sound and music contents. Specifically, de Nies et al. (2012) focus on social interaction and present an unusual and intriguing application, a music social game that uses sound, movement, and luminescent textile. The article describes the game with respect to requirements, technology, implementation, and evaluation in terms of entrainment of user groups. This specific application shows how collective creative behaviours may emerge from social interaction.

Hansen, Dravins and Bresin (2012), winners of the SMC2011 Best Paper Award, present an interactive sound toy system designed for children at an early stage of cognitive development, with combined disabilities in sensor, motor and cognitive domains. The goal is to alleviate limitations of activity due to functional disability, and to encourage children to train their listening skills, both perceptually and cognitively. Again, through the development of a specific project the authors probe some of the possibilities and consequences of enabling creativity through technology.

The last paper of this special issue, by Elblaus, Hansen and Unander-Scharin (2012), is particularly relevant to our theme as it reports on the complete life cycle of a real-world artistic artifact (a gesture controlled signal processing device for stage use) in which engineers, artists, and performers have worked together. Building on this experience, the authors propose strategies based on iterative and participatory design for structuring the development process of projects involving the use of technology in artistic contexts.

All of the articles of this special issue rely on extensive experimentation. The experiment is certainly a cornerstone for scientific reasoning, but an extended definition of experiment, which includes demonstrations and surveys, is also crucial for progress in the arts. With this issue, we hope to contribute to a better understanding of the outcomes that a creative vision of research can bring, by combining methods and approaches that are typical of art and science.

Federico Avanzini[1], *Giovanni De Poli*[1]
and Davide Rocchesso[2]
[1]University of Padova, Italy
E-mail: {avanzini,depoli}@dei.unipd.it
[2]Iuav University of Venice, Italy
E-mail: roc@iuav.it

References

Bernardini, N., & De Poli, G. (2007). The sound and music computing field: Present and future. *Journal of New Music Research*, *36* (3), 143–148.

de Nies, T., Vervust, T., Demey, M., Leman, M., Vanfleteren, J., & Van de Walle, R. (2012). Synchronizing music and movement with BeatLED: An interactive musical social game. *Journal of New Music Research*, *41* (4), 351–363.

Elblaus, L., Hansen, K.F., & Unander-Scharin, C. (2012). Artistically directed prototyping in development and in practice. *Journal of New Music Research*, *41*(4), 377–387.

Grachten, M., & Widmer, G. (2012). Linear basis models for prediction and analysis of musical expression. *Journal of New Music Research*, *41*(4), 311–322.

Hansen, K.F., Dravins, C., & Bresin, R. (2012). Active listening and expressive communication for children with hearing loss using getatable environments for creativity. *Journal of New Music Research*, *41*(4), 365–375.

Katayose, H., Hashida, M., De Poli, G., & Hirata, K. (2012). On evaluating systems for generating expressive music performances: The Rencon experience. *Journal of New Music Research*, *41*(4), 299–310.

Koduri, G.K., Gulati, S., Rao, P., & Serra, X. (2012). Rāga recognition based on pitch distribution methods. *Journal of New Music Research*, *41*(4), 337–350.

Marsden, A. (2012). Interrogating melodic similarity: A definitive phenomenon or the product of interpretation? *Journal of New Music Research*, *41*(4), 323–335.

Zanolla, S., Avanzini, F., Canazza, S., & de Götzen, A. (Eds.) (2011). *Proceedings of the 8th Sound and Music Computing Conference*. Padova: Padova University Press.