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Recent Advances in Acoustics & Music

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"G. Enescu" University, Iasi, Romania, June 13-15, 2010

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Preface

This year the 11th WSEAS International Conference on ACOUSTICS & MUSIC: THEORY & APPLICATIONS (AMTA '10) was held at "G. Enescu" University, Iasi, Romania, June 13-15, 2010. The conference remains faithful to its original idea of providing a platform to discuss mathematical models in acoustics, acoustics measurements, sound insulation, space acoustics, electronics for sound art and technology, ambiophonics, psychoacoustics, mathematical models in music, computers in music composition, pattern recognition in music, automatic music composition, biological effects of music, mathematical analysis of musical instruments etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

Synthesized Music Instruments can Play a Significant Role in Digital Signal Processing Education

Professor Roxana Saint-Nom
Electrical Engineering Department
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ARGENTINA
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Abstract: Teaching signal processing to senior undergraduate students can be an enjoyable task, provided that you are willing to spend some time to introduce them to digital music.
Leaded by a motivated R+D group in Acoustics or Audio, all you need is signal processing students who have good MATLAB programming skills and filter theory.
My talk will be focused in two topics:
1. How to emphasize Signal Processing concepts through digital music.
I will describe a laboratory assignment where students have to synthesize musical instruments in different ways: additive, FM, through physical modeling and using wavetables. I will give examples and achievements along the years.
2. Digital Music as Audio and Acoustics' research themes source
Music projects in electrical engineering environments tend to be well received. I will show several subjects that became appropriate for sponsored projects or students contents.
It is interesting to remark that mixing engineering and music help develop the cultural background of students, creates an unstructured space where new ideas emerge easily, and turns mathematics into a more friendly resource.

Brief Biography of the Speaker:
She received her Electrical Engineering degree in 1987 from the University ITBA (Buenos Aires Institute of Technology), Argentina. She achieved a Masters degree in Speech Processing from the "Universidad Politecnica de Madrid", Spain, where she is currently finishing her Ph.D thesis on Speaker Verification.
Since 1988 she has been holding academic positions in Argentina, until she became tenured faculty in the rank of the Full Professor in 2004. Since 2007 she is the Electrical Engineering Department Chair at ITBA. She is also the Director of a Master's degree joint program on Engineering Education (ITBA-Universidad de Mendoza- Universidad de Granada, Spain).
Her research area is primarily Signal Processing, Speech and Education as subareas. In recent years she started research groups in different areas, such as speaker verification, acoustics, DSP applications and EMC.
She is the author of more than 20 papers, mostly in the area of signal processing education, published in reviewed journals or presented at international conferences such as IEEE ICASSP, IEEE ISCAS, IASTED and WSEAS. She is a technical reviewer for the IEEE Transactions on Circuits and Systems and IEEE ICASSP Proceedings and SSIP IASTED Proceedings.
She is an active senior member of the IEEE. She is the founder of the IEEE Signal Processing Society (SPS) Argentina Chapter, from which she is currently Chair (2008-2009), she is the IEEE SPS Education Technical Committee Chair (2007-2009), she is a SPS Conference Board Member and an IEEE SPS Lensing Oversight Committee Member.

Plenary Lecture 2

Conceiving Music Today: Manifold Compositions, DISSCO and Beyond

Professor Sever Tipei
Manager Computer Music Project of the University of Illinois Experimental Music Studios
Composition-Theory Division
School of Music
University of Illinois at Urbana Champaign
IL, USA
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Abstract: Manifold compositions consist of all actual and potential variants of a work that contains elements of indeterminacy and is generated by a computer reading the same data for each variant. The relationship between manifolds and classes of composition is discussed and a tool (DISSCO) unifying composition and sound synthesis is presented along with some of its components such as stochastic distributions and sieves. Deterministic and random processes facilitate by DISSCO are shown to correspond to an implicit worldview and the role of the computer is described as that of a collaborator complementing the skill of the human composer. It is also shown how musical compositions can be described as complex dynamic systems and two related projects are proposed: a "sound fountain", an ever changing stream of sounds, and a "brewing" piece continuously re-arranging its parts in search of an nonexistent optimal solution.

Brief Biography of the Speaker:
Sever Tipei is a composer and theorist whose main fields are Computer Music and Music Formalization. He teaches at the University of Illinois and manages the Computer Music Project of the Experimental Music Studios. Most of his compositions were produced with software he designed and implemented at Argonne National Laboratory and at the National Center for Supercomputing Applications on high performance computers and in the CAVE virtual environment.
Tipei's papers have appeared in the Computer Music Journal, Leonardo, and in proceedings of various International Computer Music Conferences. His music is recorded on Centaur, Veriatza, and University of Illinois albums. As a pianist, he has performed in the United States, Korea, France, Italy, Belgium, the Netherlands, and Romania, and recorded for the ORION label.

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