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Plenary Lecture 1

On the Measurements of 3D Sound Propagation in Historical Theatres

Professor Lamberto Tronchin
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Abstract: The definition and measurement of sound spatialisation have been strongly enhanced in last years, as nowadays spatialisation is considered quite important during design of auditoria and virtual audio reproduction of sound quality in dedicated listening rooms for 3D reproduction purposes. Even though international standards like ISO 3382 require measuring some spatial parameters (i.e. LE, LF, IACC), usually only mono and binaural measurements are performed, by means of a dummy head, and rarely 3D impulse responses are measured and utilised for sound reproduction. In this paper, an innovative procedure of measuring spatial sound characteristics is presented. Furthermore, the methodology is compared with other techniques of 3D sound analysis. Moreover, the results of a wide campaign of measurements of spatial parameters among different auditoria ranging from Italy to Japan and Australia, are compared with the results of standard binaural and 3D measurements.

Brief Biography of the Speaker: The definition and measurement of sound spatialisation have been strongly enhanced in last years, as nowadays spatialisation is considered quite important during design of auditoria and virtual audio reproduction of sound quality in dedicated listening rooms for 3D reproduction purposes. Even though international standards like ISO 3382 require measuring some spatial parameters (i.e. LE, LF, IACC), usually only mono and binaural measurements are performed, by means of a dummy head, and rarely 3D impulse responses are measured and utilised for sound reproduction.
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Plenary Lecture 2

On Cognitive Robotics and Theories of Abstract Intelligence

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Abstract: The cognitive robot is an autonomous robot that is capable of inference, perception, and learning mimicking the cognitive mechanisms of the brain by computational intelligence. Cognitive robots emerge based on basic studies in both natural intelligence in brain/cognitive sciences and artificial/abstract intelligence in computer/intelligence sciences. In cognitive robotics, intelligence is perceived as an ability that transforms information to behavior. Therefore, abstract intelligence (αI) is the kernel and formal embodiment of general intelligence shared by both humans and cognitive robotics.

This keynote lecture presents the theoretical framework of cognitive robotics as well as their cognitive and computational intelligence foundations. Fundamental problems in cognitive robotics are formally studied on what the necessary and sufficient intelligent behaviors of cognitive robots are, and what distinguish the intelligent capabilities of cognitive robots from their imperative counterparts. Theoretical foundations of cognitive robotics are explored in the facets of cognitive informatics, neuroinformatics, abstract intelligence, cognitive linguistics, brain science, and cognitive computing. A cognitive robot is formally described based on the layered reference model of the brain (LRMB), which reveals the architectural differences and behavioral characteristics of cognitive robots. A reference model of cognitive robots (RMCR) is rigorously developed in denotational mathematics, which indicates that a cognitive robot can be formally modeled at the imperative, autonomic, and cognitive layers from the bottom up. Applications of the RMCR model are identified in humanoid cognitive robotics, advanced cognitive systems, cognitive computers, and computational intelligence.

Brief Biography of the Speaker: Yingxu Wang is professor of cognitive computing, brain science, and denotational mathematics, President of International Institute of Cognitive Informatics and Cognitive Computing (ICIC, http://www.ucalgary.ca/icic/) at the University of Calgary. He is a Fellow of ICIC, a Fellow of WIF (UK), a P.Eng of Canada, and a Senior Member of IEEE and ACM. He was visiting professor (on sabbatical leave) at Oxford University (1995), Stanford University (2008), UC Berkeley (2008), and MIT (2012), respectively. He is the founder and steering committee chair of the annual IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC) since 2002. He is founding Editor-in-Chief of Int. Journal of Cognitive Informatics & Natural Intelligence (IJCINI), founding Editor-in-Chief of Int. Journal of Software Science & Computational Intelligence (IJSSCI), Associate Editor of IEEE Trans. on SMC (Systems), and Editor-in-Chief of Journal of Advanced Mathematics & Applications (JAMA). Dr. Wang is the initiator of a few cutting-edge research fields such as cognitive informatics, denotational mathematics (concept algebra, process algebra, system algebra, semantic algebra, and inference algebra), abstract intelligence (αI), cognitive computing, cognitive learning engines, cognitive knowledge base theory, and basic studies in software science, neuroinformatics, fuzzy mathematics, cognitive linguistics, and computational intelligence. He has published 400+ peer reviewed papers and 28 books in cognitive informatics, denotational mathematics, cognitive computing, software science, and computational intelligence. He has presented 25 invited keynote speeches in international conferences. He is the recipient of dozens international awards on academic leadership, outstanding contributions, best papers, and teaching in the last three decades. He is the top popular scholar and the author of top publications at University of Calgary in 2014 and 2015 according to RG stats.