Keynote Speaker in 6th International Symposium on Temporal Design (2013 6ISTD)
24 July 2013

Opening Speech
Prof. Em. Dr. Yoichi Ando
Title: Environmental design for the third stage of human life taking individual creation into consideration

Abstract: Environments for children between just after birth and before going to elemental school acts as “a non-verbal teacher “for development brain consist of three stages of human life. These are body, mind, and the third (creation due to unique personality oriented by gene or DNA), which is most unique to human. Natural play-toys of early life like a tree, clay and water may help for creation later. In environmental design in a room, a special attention should be made of the temporal and the spatial criteria, for example, the left hemisphere development, mother’s voice and different languages as well as music, and visual movements from leaves moving in gentle breeze and twinkling stars. For the right hemisphere development, a corner and/or a panel of painting and clay works may play an important role. A typical example is creative working space (CWS), which is designed for specializing plates of activities of the left cerebral hemisphere (ex. calculation, writing sentences, reading) and right hemisphere (ex. drawing figures, painting, selection photographs) (Y. Ando, McGraw-Hill Yearbook of Science and Technology, New York 2009, p.384-389). It is worth noticing that there are infinite numbers of unknown to be solved. Creativity in science and art is originated by individual sensibility and emotion, but it may not be originated by a group study usually. Such a well-designed environment may encourage user’s challenging spirit, and in turn make an environment to expand personality. This activity is a kind of resonance between individual and the environment, so that hidden unique talent given by Nature might bloom. Such third stage of life may contribute to development of human society as culture for a long time even after passing life. Such creative activities may keep a good health for body and mind no matter their ages are even last of life.

Dr. Kohji Danjo (Saikouji Temple, Japan)

Title: An introduction to the fourth stage of human life as it relates to recovering from difficulty and illness

Abstract: Since the time that human life first appeared, worship has been an important human activity throughout the world. It does not relate to the first (body) or second (mind) stages of human life. Nor is it really about the third stage of life, i.e., creations based on individual personalities that might contribute to human society. The fourth stage of human life, which refers here to the happiness and lasting peace of human beings, is closely related to the third stage of life, but it expands to embrace another element of life that includes worship as communication between humanity and nature. These days, humans encounter many difficulties and illnesses due to environmental change, many of which are caused by the ill-defined concept that time is money. The purpose of this study is to clarify how we can recover from difficulties and illness encountered in families, societies, and nations, including ill-treatment and disputes caused primarily by keen competition due to the time is money concept, that in turn often leads to worldwide wars.

The author has visited the houses of parishioners to participate in religious services since the age of eleven, influenced partly by the memory of his father, a chief priest who passed away at young age. Question arose at this time, especially, ”Does the soul still live after death of the physical body?”. These questions have been pondered since the ancient era. One of the author’s reactions to these questions is that there seemed to be religious ties to both the present world and another world.

The author assumes that consciousness can be classified into three items: (1) actual, (2) potential, and (3) cosmic. These three points are the basis for this discussion on the fourth stage of life as well on the first to third stages defined above.

Prof. Akio Takatsu (Kobe-Yamate University, Japan)

Title: Temporal and Spatial Design in Architecture

Abstract: With regard to the two cerebral hemispheres, it has been indicated that the left hemisphere controls language, logic, calculation, and time-series processing, while the right hemisphere governs nonverbal cognition and pattern processing. According to recent findings, the general characterization of the left hemisphere as “the brain for temporal perception” and the right hemisphere as “the brain for spatial perception” contributes to better understanding people’s relationships with the environment in terms of psychological reactions. However, a spatial perspective still tends to dominate in the planning and designing of buildings and the urban environment. In fact, a planning or design methodology that successfully employs a temporal perspective has not been established. On the other hand, a temporal design approach is basically regarded as associated with three concepts: the development of the body as the first stage of development, the development of the mind as the second stage, and the development of individuality as the third stage. This paper presents a hypothesis related to a temporal design methodology that addresses the third stage of development. The flowering of one’s individuality requires an awareness of how he or she differs from others in terms of DNA; this can be achieved by a person when he or she vitalizes his or her brain to a degree that renders even subtle differences perceivable. Since the brain receives the maximum impact when both cerebral hemispheres are effectively stimulated by such vitalization, both of the temporal-design and spatial-design shall be needed. In spatial planning and design activities, drawings and models are normally produced using more than one prevailing scale of factors. Similarly, there are prevailing scales of time used in temporal planning design, which is attempted to summarize in this paper. In addition, the author summarizes the elements that will be addressed by the planning and design activities conducted within the prevailing scales of time.

Prof. Wei Hui Wang (National Taiwan Ocean University, Taiwan)
Title: Application of Psychoacoustics and Sound Quality Assessment in Noise Control in Rooms

Abstract: Room acoustics uses mostly physical values. However, room acoustics should also describe the conditions leading to good hearing in a room. Because hearing characteristics are described by psychoacoustical data and values, it seems reasonable to introduce these values into the description of room acoustics. This often means that temporal and spectral effects should be described using total loudness as a function of time, or the three-dimensional distribution of specific loudness versus critical-band rate pattern as a function of time. In addition to that, other psychoacoustics values such as fluctuation strength, partial masking or sharpness, roughness, RASTI value, can be used to describe the influence of room acoustics on the characteristics of sound at the place of a listener. A few examples will illustrate these effects. Among which the sound generated by the exhauster in a kitchen is one of the noise sources to make people annoying. The assessment of the sound quality of a specified exhauster is conducted by using the head/ torso simulator and the software dB-sonic to identify the cause of annoyance. It has shown that the sharpness and the loudness are the two predominant factors to cause annoyance. To improve the sound quality in a kitchen, the proposed countermeasures have attained the improvements as that the noise level is reduced 12.9 dB, the loudness reduced 13.1 sone, the vibration levels of the exhauster casing shell are reduced in a range of 1~5 dB, and the annoyance index of the sound quality is reduced from 13.2 to 8.2.

Prof. Jian Kang (University of Sheffield, UK)

Title: Sound propagation at micro-scale in urban areas

Abstract: Whilst large scale noise-mapping techniques have been applied extensively in practice, as required by the EU Directive on environmental noise, they are often not applicable for micro-scale urban areas such as a street or a square. This talk will discuss a series of simulation techniques as well as related acoustic theories for accurately calculating the sound field for micro-scale urban areas. This includes energy-based image source methods for street canyons and urban squares with geometrically (specularly) reflecting boundaries, image source method considering interference, ray-tracing, radiosity model for diffusely reflecting boundaries, transport theory, equivalent source method, and some other models. Techniques for urban acoustic animation will also be briefly discussed.

Prof. Lixi Huang (The University of Hong Kong, China)
Co-authors: Yumin Zhang, Zeyi Zhang
Title: Absorption of low-frequency ventilation noise

Abstract: Ventilation noise inside a building may not be a critical issue in most circumstances but a quiet ventilation system is certainly a desirable feature.
The noise is typically broadband and rich in low-frequency content. There are few options for noise absorption when the space for installing absorbers is limited. This talk describes an electro-acoustic method to reduce the required volume for a passive absorber. The absorber consists of a moving-coil loudspeaker diaphragm backed by a cavity. When incident noise pushes the diaphragm, it moves and its structural damping consumes some sound energy. The noise absorption performance would improve if the terminals of the moving-coil are shorted, leading to the generation and consumption of a small amount of electricity. A properly tuned diaphragm may absorb most incident sound within a narrow frequency band, like a typical resonator. The bandwidth depends on the cavity volume which limits the low-frequency performance as air in the cavity resists volume changes by sound. This study introduces the use of a special coupling between mechanical (acoustic) and electro-magnetic forces to counter the cavity stiffness at low frequencies. An RLC shunt circuit is attached to the moving coil giving an electrically induced mechanical impedance. This impedance overcomes the cavity stiffness below the system resonance frequency while, at the same time, it reduces the system inertia above the resonance frequency. Both factors are favourable for sound absorption and the result is a very broad absorption band. The performance is compared favourably with ordinary porous material and micro-perforated panels with the same cavity volume. It is argued that the development of such a shunt technique will help low-frequency ventilation noise absorption in buildings where space limitations exclude the use of bulky passive absorbers.

Prof. Gary W. Siebein (University of Florida School of Architecture, USA)
Title: Architectural soundscapes

Abstract: Soundscape theory provides a vehicle to unify the acoustical analysis, design and evaluation of existing, proposed and imagined architectural, environmental, audio/visual, virtual and natural environments. There is significant interest in soundscape approaches to acoustical design particularly in urban, natural and other outdoor environments. The potential of the theory proposed by Murray Schafer to truly create a new interdiscipline involved with the creative composition of sustainable soundscapes in buildings, cities, towns, rural and natural areas and to build bridges among the architects, urban designers, landscape architects, interior designers, acoustical designers, engineers, politicians, inhabitants, musicians, scientists in various disciplines and soundscape designers involved with the evaluation, design and construction of these soundscapes: real, under design or imagined, is currently being fulfilled. Soundscape methods are much broader than traditional acoustical and architectural or urban design processes. They are inclusive of all participants in a heterogeneous community and attempt to creatively engage individuals and groups involved in an iterative, multi-faceted process. The technical methods include identifying the acoustical communities involved in the project in the broadest sense of the word; mapping the ecological and sonic structures that connect the community members; documenting the acoustical itineraries of the participants in the soundscape; observing the acoustical calendars present; measuring sounds in the ways they are perceived by people and wildlife through recordings of the sounds themselves, long term measurements of overall average sounds present, and short term detailed measurements of the specific acoustical events that comprise the ambient within a building or environment; transforming the qualitative and quantitative acoustical data of various types into aesthetic structures and expressions of the essence of the soundscape as an element in the overall conceptual and functional design of the project. Examples of constructed projects; designed, unbuilt environments; and basic research studies investigating aspects of this theory will be presented to illustrate the components of the theory.