

### **1.1. INTRODUCTORY REMARKS**

Architecture has often been simplistically defined as ‘frozen music.’ In this introduction, “frozen music” is to be used as a departure point for this study. Thus, it is believed that spaces for music often do not reflect much about music but serve merely as carriers of sound, i.e. as auditoria. It is an intention to go beyond this architectural functionality vis-a-vis music. Architecture for music should be a reflection of a musical concept or idea in a metaphorical approach. Architecture should proactively be a changing reflection of music and not merely act as “frozen music”. The spatial experience generated by the spaces for music should be colourful and rhythmically exciting or pleasant and tranquil according to the music that is being performed. Music changes peoples’ experiences. Thus, if in tandem with music, architecture also changes peoples’ experiences, music and architecture can be two intimately coexisting elements, and together will create a much more holistic event.

The experiential relationship of music and architecture exists in many aspects. This investigation deals with the sensational experience of sound and space in an auditorium, primarily in terms of spatial impression. If there is a relationship of sensational experiences between sound and space, what similar terms may be used to describe both auditory and visual spatial impression? What are the physical relationships and objective parameters in relation to spatial and acoustical dimensions of the auditoria? How do auditory and visual spatial impressions vary within an auditorium and between auditoria? What is the degree of correspondence (or contrast) and interaction between auditory and spatial impression within an auditorium? As humans are the ones experiencing sound in a space, how can their subjective responses be analysed and applied in designing concert halls?

The physical relationships between sound and space have been explored widely in the acoustical and design discipline in auditorium design. However, the visual counterparts to auditory spatial impression are, in particular, generally under-explored in both architectural design and auditorium acoustics disciplines.

## **1.2. PURPOSE**

This study gives an overview of the objective influences of sound, music and architectural design on the designs of 20th century symphonic concert halls. It suggests that the visual counterparts to auditory spatial impression are generally under-explored in both architectural design and auditorium acoustics disciplines. This study will examine the instances of different auditoria that have been designed for symphonic music performance. The subjective and objective parameters relating to auditory and visual spatial impression of these auditoria will be explored. Some concrete suggestions will be made on how new concepts can be applied to designing performance spaces so that they are experientially more rewarding.

## **1.3. SIGNIFICANCE OF THIS STUDY**

As most current architectural and auditorium acoustic research is individually focused, this study contributes to the understanding of the relationship between the visual and auditory spatial impression in auditoria. In addition, this study can make an important contribution to the designs of future concert halls to engender a more diverse auditory and visual spatial experience.

## **1.4. APPROACH**

The main body of this thesis includes, Chapter 2 – the textual analysis of auditory and visual spatial impression, and Chapters 3 to 5 - the physical and subjective analysis of auditory and visual spatial impression. Chapter 2 is devoted solely to reviewing the current literature in auditorium acoustics, architectural design and auditory visual perception and in turn establishes a starting point for the study. Chapter 3 will present the first experiment in the series, which illustrates the relationship of visual spatial impression in three concert auditoria and shows how one may affect the other in synthetic contexts. The conclusion is primarily based on the experimental result and textual analysis of related literatures. Chapters 3 and 4 present the second and third experiments, which compare subjective judgement of the sound and space between auditoria and within an auditorium. In chapter 5, additional experiments (visual and auditory combined) are conducted to analyse the relationship between the

impressions, and to identify possible interactions between the auditory and visual spatial impressions in one auditorium.

This study, in itself, is considered to be a small aspect of the understanding of the larger topic of the spatial experience in concert halls. Chapter 6 discusses other factors that may have not been taken into account in the study of visual and auditory spatial impression and analysis of the sensational relationships of space and sound. It also discusses other aspects of the relationship between space and sound, such as the relationship between music and architecture, since these other aspects make an important contribution to the music and architectural event.

The thesis concludes in Chapter 6 with suggestions on how all these new understandings may be exploited in designing spaces for music. Further studies are needed, as this thesis is a small step toward a greater understanding of the relationships between space and sound, architecture and music in concert auditoria. The remaining section of Chapter 6 discusses potential future research.

The rationale for following this approach is to follow the quantitative research approach in architectural science in general and auditorium acoustics discipline in particular. However, in the exploratory stage of this project, the research approach is relatively undefined. Further discussion about the research approach is to be found in chapter 2.

