

# Out of the musical box

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The present paper explores the correlations of music and architecture through a design studio project carried out by second year students of the Architecture programme at Nottingham Trent University in the United Kingdom. In addition the paper looks into some of the most representative architects and composers who have materialized this connectivity between space and music. Last but not least this appraisal intends to illustrate how the students' creative process and spatial understanding may be influenced by introducing music as an analogue to understand architecture.

*"Architecture is music in space, as if it were a frozen music."*<sup>1</sup>

Departing from Fredrich Von Schelling's seminal analogy of architecture as frozen music, this paper presents the moulding, development and final realisation of a student design project inspired by the Pamphlet Architecture Series: 'Architecture as a Translation of Music'. The primary objective of the architecture student project discussed in this paper was to encourage students to explore connections and correlations in the language of experimental music and architectural forms as well as spatial exploration.<sup>2</sup>

The project brief was divided into three sub-projects containing both group work and individual design proposals. Stage 1 involved working in groups to meet, compose, document and perform a piece of experimental music. Stage 2 required the students, also working in groups, to produce 3D physical models, a sonic sculpture. The final Stage took the form of a more traditional architectural design project, where the students would produce individual proposals for a centre of the performance and appreciation of experimental and avant garde music.

The specific aims of the project sought to explore historical and theoretical connections between music, more specifically experimental music, and architecture. In addition it also intended to promote interdisciplinary, experimental and creative activity as well as to establish a better understanding of an aural orientation to architecture.

## Why music, experimental music as an analogue to architecture?

Before moving forward to describe in detail the stages, design process and outcomes of the project, it is important to mention, firstly, the potential that the authors of this paper visualised in establishing an association between music, experimental music, and architecture as an inspirational motive for an architectural student design project. Secondly, to expose the rationale behind proposing three developing stages embracing individual and holistic intentions.

The historical association between architecture and music has been well studied and documented. From Vitruvius to Alberti and Palladio musical or harmonious proportions provided the tantalising basis for establishing architectural space as a manifestation of divine truth.<sup>1</sup> In the modern era Le Corbusier continued the music dalliance with his evocation on Manhattan as '...hot jazz in stone and steel'.<sup>2</sup>

Also the later collaboration between Le Corbusier's and Iannis Xenakis innovatively addressed correlations between music and architecture. Their exploration of creating space through music and vice versa was materialized in their design of the 1958 Phillips Pavilion which took inspiration from Edgar Varese's progressive moment in experimental music, the 'Poem Electronique'. More recently, Stephen Holl's architectural design for the Stretto House in Dallas illustrates an actual transfiguration of musical transcription ('parallel to Bella Bartok's Music for Strings, Percussion and Celestra'.<sup>3</sup> Other pieces of architecture such as the Soundbox Swiss Pavillion at the Hanover Expo 2000 reiterates Peter Zumthor's recurring acknowledgement of the correlations between architecture and music.<sup>4</sup>

Within this appraisal it was thought that by students, performing, listening to and consuming experimental music in some form or another would represent an embedded, shared and articulated cultural inspiring experience. As such, it was hoped that all students would be able to capitalise on some degree of musical 'fluency' to quickly recognise a common language across the musical composition, performance, sculpture and architectural design.

The 'Out of the Box' project intends to encourage creativity by thinking differently and it was therefore thought that a music-based theme would encourage this whilst maintaining a certain amount of familiarity. During the conception of the project, it was important to consider that not all architecture students would have the same knowledge or preference in music. Therefore it was thought that the world of experimental music would offer a challenge which, whilst providing a rich conceptual seam, would also take students out of their musical comfort zone to ultimately encourage a more considered and analytical approach in their composition and design process.

It was also thought that by using experimental music as an analogue, constraints of typological and historical associations of, broadly defined, 'classical music' could be avoided whilst allowing the conversation to remain within a relatively 'known' field of music. To establish this conversation, a significant research, analysis and interpretation on experimental music was needed. Therefore, an experimental music workshop stage was introduced in the brief.

In actuality, this experimental music workshop would entail students to engage with music, which is – by and large – stripped of any immediate cultural meaning or signifiers. Typically, this might mean little or no lyrics that could suggest a context or narrative to design and no 'pop' tunes which could also have memory and cultural or historical associations. In so far as possible, this exercise required the students to listen and analyse 'raw' sounds, which would encourage them to make intuitive, creative and strategic correlations between their analysis of the music and the composition of physical form and space.

This view held true in the final reviews, where many students who might have previously struggled to express creative and conceptual themes within their work were able to articulate a relatively sophisticated design language derived from researching a particular genre or composer's work.

*'When I first started doing this project I didn't have any idea how to link music and architecture, but after developing a sculpture it did helped me to realise one can create a link between architecture and music. Developing the sculpture was one of the most important parts of early stage of design process of the pavilion', 'without doing the music piece and sculpture I would have straggled to create a link between music and architecture'.<sup>5</sup>*

## **Materializing music and composing spaces.**

*'...an experimental action is one the outcome of which is not foreseen.'<sup>6</sup>*

As previously mentioned, the appraisal's structure comprised three different stages:

Stage 1: Introduction, composition and performance of experimental music.

Stage 2: 3D conceptual representation (sonic sculpture)

Stage 3: Spatial composition (architectural representation)

It was thought that these three stages would guide students gradually from an abstract and conceptual understanding of harmony, time and space in music to a 3D sculptural representation and ultimately to a materialization of architectural space. Although each stage had its individual character they also overlapped foreseeing a common harmonious and aesthetic aim.

### **Stage 1: composition & performance articulation of stage 1**

This stage formed the student's introduction to experimental music, its production and performance. As part of the brief, the students were required to work in groups to compose, score and perform their own experimental music piece. Initially, students were provided with graphic materials such as videos and recordings of a range of genres and leading exponents such as:

Arnold Schoenberg - Expressionism.

Brian Eno – Ambient.

Philip Glass – Minimalism.

John Cage - Experimental Modern.

Alice Coltrane - Avant Jazz.

Once students got more familiarized with experimental music they were to compose, score and perform, in groups, a piece which was to last 4 minutes and 33 seconds. The main rationale behind setting this particular time was taken from John Cage's notorious piece: '4'33" of silence'. Through Cage's piece, students were introduced to the importance of silence to music such as voids are important to architecture. Goffi's analysis on the correlations between music and architecture through the study of the mutual influence between the architect Carlo Scarpa and the composer Luigi Nono describes how Scarpa's voids in architecture are analogous to the role of silence in music.<sup>7</sup>

Also, and from a mere practical approach, this 4 minutes and 33 seconds provided a standard time across all groups, thus helping students to manage their composition and performance within a specific frame time.

Parallel to the introduction to literature and music references, seminars and studio discussions provided a strong theoretical background on experimental music as well as the kinetics of reflective and critical thinking. Students were encouraged to consider a combination of traditional instruments, random objects, voices, bodies as well as the aspects of the space(s) in which the piece of experimental music was to be performed. The 1958 Philips Pavillion architectural form which was conceived in close relationship with the 'performance space' envisaged by Xenakis and Le Corbusier vis-à-vis Nono's compositions with a particular conception of space sought to inspire students creations.

'Nono's understanding of 'performance space' is nontraditional: he composes music with a specific space in mind, interspersing multiple musical sources in both stage and audience'.<sup>8</sup>

## Summary of the musical performances

This first stage intended to highlight the connection between the conceptualisation, documentation and instruction inherent in the production of experimental music and its relationship with the process of understanding and creating architectural spaces. In addition this stage also introduced the idea of ‘reproducibility’. The fact that the students piece of experimental music had to be scored (i.e. written out) and performed more than once with at least one group member conducting it would differentiate a musical composition connected to space and time from a random piece of chaos (unless, of course, randomness and chaos formed a component of the conceptual idea).

Although it was not originally foreseen, the student groups ended up performing their pieces on three occasions proving that an effective scoring method (figure 1), whichever it was, had been applied in order to make the piece reproducible. This was also particularly useful as students were able to refine and improve aspects of the piece which had not been fully considered for the initial recital. These included the visual impact of the piece, the need for the conductor to control the performance to properly express the composer’s intention and – of course – the actual aural experience. Students were also encouraged to reflect on the team dynamics’ analogy between musical and architectural production.

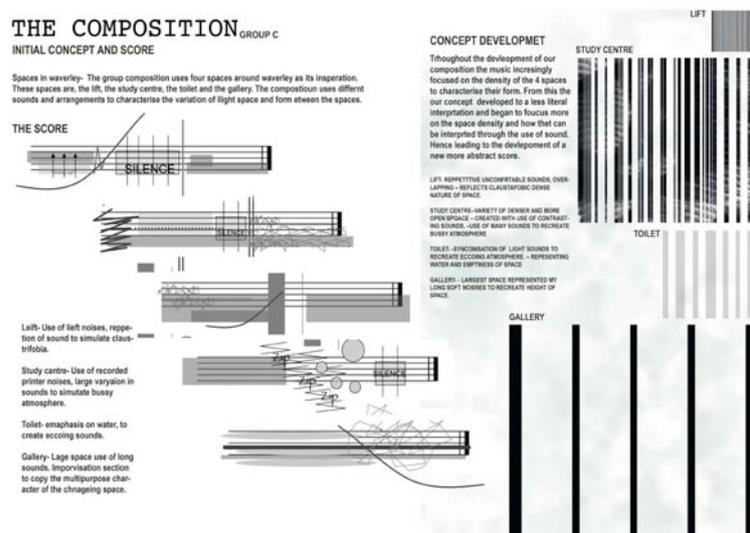


Figure 1  
Student group composition scores.

The discussions and workshops arranged by invited experts on experimental music such as Trevor Lines from the Birmingham Conservatoire of Music provided a wider framework and stronger basis for the students to identify and analyse architecture and music as analogues. Trevor’s input as a composer and lecturer on experimental music provided a more in-depth overview, explaining the theory, application as well as particular experimental techniques such as ‘free improvisation’, ‘musique concrete’ and ‘atonality’ amongst many others.

In addition, the students were also exposed to the graphic nature of experimental music scores enabling them to reflect and compare the traditional and not so traditional methods to communicate and reproduce music. In this workshop students came across with the use of unorthodox and innovative techniques used in experimental music where traditional musical notation would be limited or even impossible. The latter was extremely useful as analogue of how space is traditionally communicated with plans, sections, elevations, perspectives and their advantages and limitations as 2D communication tools.

By and large this was considered a successful exercise by the students who creatively responded to the challenge of being out of their comfort zone. Although some of the conceptual ideas were somewhat limited – ‘a walk round the park’, ‘a day in the life of a building’ the music pieces themselves took a more thorough approach during the performance.

The latter allowed in some cases to step back, rethink, rework and conceptualise ideas with a more thorough critical approach. In this regard contextual connections between music and the environment played a very important role, as they do in architecture, for the audience’s experience. On this note, one of the groups performed their piece to a blindfolded audience in a park where background sounds from wind, water, tree leaves, park visitors, runners, birds and tram amongst many others became part of the actual performance. On the other end, another group developed a more dramatic visual performance which, possibly to overcome initial embarrassment, required performers to wear a masked uniform (figure 2). Whilst allowing students to perform anonymously this had a very strong visual impact on the audience and greatly enhanced the repetitive and droning elements of their piece.



**Figure 2**  
**Student group music performance.**

## **Stage 2: sonic sculpture** **articulation of stage 2**

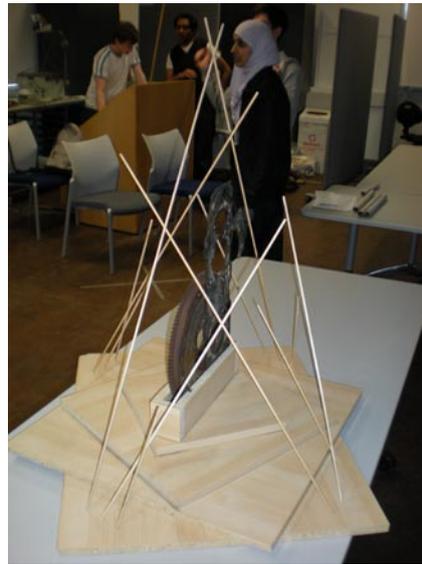
The purpose of this stage was to encourage the students to articulate the aural sounds and compositions in physical terms. Taking traditional wind chimes as a primer, they were presented with various examples and asked to research further and consider kinetic, static, interactive, site specific or combined approaches. Some of the case studies presented to the students included: Singing Tree<sup>3</sup>, Playing the Building<sup>4</sup>, Sound Space Sculpture<sup>5</sup> and Weather Harp.<sup>6</sup>

The primarily function of moulding a sculpture was to demonstrate the materialization of music /sound in a 3D representation. This was to maintain an interpretive connection with the previous exercise and move towards ideas of constructed space without being diverted by the functional demands of an architectural brief. A similar sequence was also established in the translation from music physical form to tectonic space. However, whereas the aesthetic aspects of the musical performances developed organically and opportunistically, in this instance, the students were asked specifically to consider other sensory and aesthetic qualities such as the

visual and tactile nature and interpretation of sounds in their sculptural installation. With the advantage of having available joinery and metal workshop students were free to select materials as they felt appropriate.

### Summary of the musical performances

The challenge to translate abstract elements into physical ones seemed somehow repressed by the limited approach to exploit the sonic possibilities of the used materials. To a certain extent this demonstrated the degree of difficulty of this transition stage. Whereas the plastic nature of the musical pieces together with multiple performances gave rise to experimentation, refinement and an accumulation of ideas, the need to commit to a physical ‘product’ led the groups to focus on pre-determining the form of the object rather than engaging meaningful experimentation in the spirit of Cage’s definition<sup>9</sup>



**Figure 3**  
**Sonic sculpture.**

Only two groups developed their ideas within the context of specific locations and with little discernable sonic impact. Whilst a high level of competence was displayed in the crafting of the pieces and a good degree of thought was given to formal symbolism, this broadly ‘means-to-amend’ approach offered little sonic innovation leaving the sculpture with a rather static and mute quality, which was almost certainly unintentional. A more thorough approach to the sonic possibilities could have allowed a stronger integration to music performance.

Despite the challenges throughout the exercise, stage two proved to be a successful bridge towards an engagement with architectural possibilities.

### Stage 3: architectural design project

*“I have practiced architecture and conceived spectacles, but what really counts for me is music. It passes through the ears and not through the eyes. That’s why the concert is a manifestation that is in fact very hostile to music: you are surrounded by many people, some cough, sometimes they even smell bad! They prevent the sound from coming: at the concert, one should close ones eyes and listen.”<sup>10</sup>*

Stage 3 formed the primary component of the overall project. Also as the culmination of a process, it was hoped that through a structured process of experimentation, analysis and research in music, the students would have developed a sophisticated composition language

to describe their architectural visions. The brief identified a fictitious client, an experimental musicians' collective [as exemplified by Trevor Lines] who were looking to develop a centre which would enable group and individual performances, experimentation, traditional recording and public integration. The imaginary client group called N.O.T.E. – Nottingham Orchestra for Transformative Environments was then introduced to the brief.

The centre or pavilion was described as homage to experimental music and also of architectural experimentation. A series of spaces were included in the brief for initial guidance.

It was accepted, in the experimental spirit of the exercise that the proposal might be in the form of one or a series of spaces, temporary or permanent, open to the elements or completely enclosed. Furthermore it would be acceptable – leading on from the sonic sculpture stage - for a strong conceptual response to develop an experimental environment, spatial and musical, which might forgo the functional aspects of providing toilets, café-space and so-on. Students were challenged to consider radical re-use of mundane spaces such as toilets' for their potential as improvised or opportunistic performance spaces. This might provide consequential opportunities to re- think how musical performances may be held and appreciated by diverse audiences and the common relationship between performer and audience in traditional performance venues.

Studio group and individual discussions gave support to the theoretical background and a broad range of precedent studies were offered, from Renzo Piano's IRCAM Centre, Paris to the Band Stand at the De La Warr Pavilion in Bexhill, UK by Niall McLaughlin. In addition, interactive group dialogues as well as discussions with Trevor Lines established a framework for developing unorthodox spatial solutions for opportunistic musical experimentation, sonic encounters as well as to simply appreciate spatial acoustics in their own right. The various studio discussions with Trevor also transmitted to the students his own experience, as a musician, on how one might respond to the acoustic qualities of various spaces in terms of performance: 'Reverberation in a space can be considered as an element of composition as well as the incorporation of background noises ultimately using the space as an instrument of composition'.<sup>11</sup>

The decision to keep the brief relatively flexible intended to allow students to concentrate on thinking creatively about architectural form and space in relation to acoustic opportunities and musical experimentation, which formed the primary focus of stage 3. By prioritising design development and physical modelling as the main spatial communication method, the exercise sought to emphasize three dimensional thinking and spatial expression derived from an intuitive interpretation of musical analysis. In a similar way, the brief placed an emphasis on the selection and application of materials for their acoustic possibilities giving the students opportunity to play, sculpt and experiment with architectural form in dialogue with the chosen inspirational music.

In an extreme case this could lead to an architectural language stripped of any context other than its own relationship with music, and potentially devoid of and material consideration of architectural practice. However in the context of the 'Out of the Box' project this would be considered valid and even desirable creative experimentation

### **Summary of the architectural design projects**

Through tutorials and studio presentations, it was made clear to the students that they were to take responsibility for the degree in which their analysis and research informed the architectural proposals. As such schemes ranged from abstract sculptural forms and spaces to more traditional pavilion solutions. The former tended to strongly evoke their musical inspiration whilst the latter

made greater reference to building programme and user experience. Some students worked on explosive form developed as an extension of their sonic sculpture and represented a singular frozen moment of sound. Despite the free rein, certain types of approach were identifiable depending on whether students considered a piece of music, a genre or a particular artist or composer. Analogous descriptions such as ‘sharp’, ‘tense’ and ‘collision’ would provide a basis for establishing architectural form and planning. In some instances this lead to somewhat vague platitudes where words like ‘warm’, ‘relaxing’, ‘enveloping’ offered few clues to developing a convincing design language.

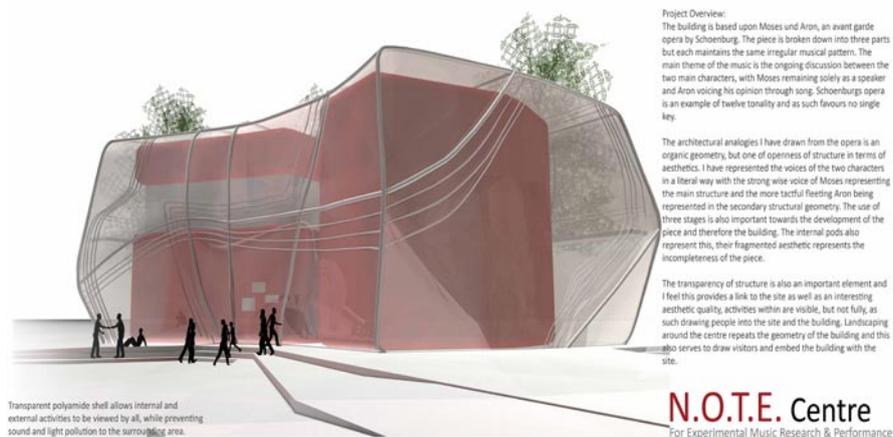
Some students, however, – although gently discouraged – were intent on selecting from their own music collections. In some cases this, lead to an unnecessary emphasis on explaining the validity of choosing a particular piece of music. In addition and in some cases the inability to separate musical appreciation and an analytical approach provided the basis for making architectural judgements.

A more direct architectural application was to identify musical genre such as expressionism or minimalism and use this as a basis to research actual architectural expressions. At a basic level, for example, a student might have made a credible connection between the minimalist compositions of Philip Glass (as illustrated in figure 3) and a conceptual idea or design proposal that referenced particular architects such as Mies Van de Rohe, Luis Barragan, Louis Kahn, etc., as precedents.

“The inspiration for my design derived from the work of Philip Glass and in particular the composition ‘Metamorphosis’, which transports the mind away from the world into a state of Serenity”<sup>12</sup>



**Figure 4**  
**Music pavilion design by Aaron Marriot.**



**Figure 5**  
**Music pavilion design by Thomas Wallis.**

Tom Wallis' response to Schoenberg's opera *Moses & Aaron*, illustrated in figure 5 took the ideas of atonality and the incomplete nature of the work to develop themes of incompleteness, endless and distorted space as understood by Ben Van Berkel and his UN Studio work.

An interesting and thorough study was that developed by Clarissa Wenborn, who interpreted the monumental stillness of Louis Kahn as a key generator of light form and space and the relationship with Alice Coltrane's cosmically spiritual avant-jazz (figure 6).



**Figure 6**  
**Music pavilion design by Clarissa Wenborn.**

## **Conclusions/further steps**

*"Hearing structures and articulate the experience and understanding of space... Every building or space has its characteristic sound of intimacy or monumentality, invitation or rejection, hospitality or hostility... but the acoustic percept usually remains as an unconscious background experience."*<sup>13</sup>

As previously expressed at the beginning of this paper, far from drawing strict conclusions from this design studio exercise outcomes the authors of this appraisal intended to explore the potential of creating music correlations between music and architecture as a means of creativity and spatial understanding.

Being this 'Out of the musical box' the first of a series of design studio projects to search for the correlations between music and architecture, various afterthoughts have been drawn by the authors reflective analysis of the project's process and outcome. In addition, an extremely valuable student feedback questionnaire provided ideas for improvement and further experimentation.

From this first exercise it was concluded by the authors that a further inclusion to embrace the other senses could be also of high value. It seemed that placing emphasis on the non-visual was the core and strength of the exercise. Similarly it might be productive to explore a more general definition of 'sound' rather than specifically 'music' (although concentrating on a specialist area gave a focus to the project that allowed for a broad range of activity and experimentation).

Recent architectural phenomenological discourse initiated by Steen Eiler Rasmussen and developed by Juani Pallasmaa has criticised contemporary architecture for privileging sight to the detriment of other senses and, in doing so, disconnecting our built environment from the world of a truly sensual / sensory- experience. Also, and in a more tangible realm the work of various architects have demonstrated the correlation between architectural and musical experimentation. Zaha Hadid's installation at Manchester Art Gallery for the performance of

JS Bach's chamber music as part of the Manchester International Festival, the MUMUTH centre in Graz by UN Studio and Grimshaw's Experimental Media and Performance Centre in New York all indicate that there is a growing area of architectural practice where spatial and musical experimentation can thrive.

## Notes

1. In David Simpson's introduction to F.W. J von Schelling: *The Philosophy of Art*, trans. D. Stott (University of Minnesota Press, 2008), the phrase translated into English as "*architecture as frozen music*" is reported as being used by Johann Wolfgang von Goethe in "Conversations with Eckerman" (published 1836) but appearing earlier in von Schelling's *Philosophy of Art* (published 1802-3).
2. Although driven by a strong community-based ethos, the young School of Architecture at Nottingham Trent University, UK, has included in the second year degree of the B(Arch) program a design stage named 'Out of the Box'. This stage has mainly been designated for projects underpinned by strong conceptual ideas looking to challenge students outside their conventional comfort zone. Generally one could say that there is characteristically a more overt emphasis on creativity encouraging students to work and think across creative disciplines. Various student appraisals such as that presented by Gregory Young have demonstrated that a creative discipline such as music can be of great value in teaching architectural design.<sup>3</sup>
3. The 'Singing – Ringing Tree' designed by Architects Tonkin Liu is described as a 'tree' of stacked pipes of varying lengths, which as the wind passes causes the tree to 'sing' chords. It is situated on a hillside at Crown Point in Burnley, UK.
4. David Byrne, lead singer with the group Talking Heads, devised a sound installation that connects physical parts of a building's structure back to a traditional pump organ. By pressing keys on the organ, notes are created directly from the building fabric. The work has been installed most recently at the roundhouse in London, UK.
5. Bernard Leitner, Austrian artist, created a Sound Space Sculpture used sound itself to create space as a way of appreciating physical space as an internal experience.
6. Commissioned by the City of Melbourne, Australia, The Weather Harp by David Murphy and Cameron Robbins is a kinetic sculpture that is fixed to the side of the building and is 'played' by wind activated devices or by passing members of the public.
7. Fil Hearn, 'Proportion in the Renaissance' in *Ideas That Shaped Buildings*, MIT Press, 2003, pp 169 – 176.
8. David P. Brown, *Noise Orders: Jazz, Improvisation and Architecture*. University of Minnesota Press, 2006, p 66.
9. Stephen Holl, 'Stretto House' in *Architecture as a translation of music: Pamphlet Architecture 16*, ed. Elizabeth Martin, Princeton Architectural Press, 1994, p 56.
10. Peter Zumthor, 'The Sound of a Space' in *Atmospheres: Architectural Environments, Surrounding Objects*, Birkhauser, 2006.
11. Watudura Karunaratne. Student feedback questionnaire for the 'Out of the Box' Integrated Design Studio Module, B(Arch) Program, Nottingham Trent University.
12. John Cage. "Indeterminacy," Part II of "Composition as Process" in *Silence: lectures and writings by John Cage*, 1958. Wesleyan University Press, 1973, p 39.
13. Federica Goffi-Hamilton, Carlos Scarpa and the eternal canvas of silence. *arq: Architectural Research Quarterly*, 10, pp 292.
14. Ibid
15. John Cage. "Indeterminacy," Part II of "Composition as Process" in *Silence: lectures and writings by John Cage*, 1958. Wesleyan University Press, 1973, p 39.
16. Iannis Xenakis, 'Music as an Art of Space' in *Iannis Xenakis & Sharon Kanach Music and Architecture in the Work of Iannis Xenakis*.
17. Trevol Lines. *Experimental Music and Architecture Student Workshop for the Integrated Design Studio Module at Nottingham Trent University*, April 2009.
18. Aaron Marriot. 'Out of the Box Project' in *Student Portfolio, Integrated Design Studio Module, Second Year B(Arch)*, Nottingham Trent University 2009.
19. Juhani Pallasmaa, *The eyes of the skin: Architecture and the Senses*. Chichester: Wiley-Academy; Hoboken, NJ: John Wiley & Sons, 2005, p56.