Sound inhabits space wherever architecture occurs. Sound is a non-visible, but physically tangible character of space. Albeit in architecture and urbanism much of the discourse focuses on the visual aspects of space, Sound is a crucial invisible but tangible character of space. It has a large impact on the quality and the perception of space and it greatly influences our daily life. There are many disciplines that study the relation between sound and space, such as physical acoustics, psychological aspects and artistic dimensions of sound. However, the focus of my research was to describe a city fragment by the soundscape and investigate the influences on its soundings by the physical character of the space, and not the last on the perception of the space.

From research to design my graduation project focused on exploring one of the immaterial spatial phenomena of space, sound, that brings a fourth dimension to architecture and is able to describe the character, the function and the success of the space/public space. The main goal of this project was to study and test how sound challenges the limits of architecture and how architecture affects the sound of space. During the research and design I was seeking to explore the aesthetic significance of sound in relation to space, sound and body.

“..it was not the home, but the city, which expressed and symbolized a person’s being and consciousness.”

Henry Lefebvre, Writings on Cities, pg 7.

Research

Our modern and contemporary architecture has been greatly engaged with the visual aspects of space often excluding the non-material dimensions that create overall the atmosphere and the experience of space. Architecture is not only the images we see, but in fact a multidimensional experience, which goes beyond the visible.

From this perspective to space my research question was formulated as: how can the characteristic and qualities of sound become an alternative way of mapping, interpreting and designing space?

The way I approached my research on sound and space in relation to architecture is based on the theory of B.Blesser and L.R. Salter in the combination of R. Ganchrow. All architecture theoreticians dealing with the relation of sound and space, suggests that in the perception of sound the observer is the vantage point, the center of space, and from this point sound is able to deform and distort the perceived space. In the Aural Architecture: The invisible character of space, Blesser and Salter theorize the aural arenas that shaped around the observer, who is the center of space. They emphasize that the materiality of the physical space is able to reconfigure our aural arena. They suggest that sound interacting with reflecting surfaces acts like amplifiers of the aural space, while absorbing materials shrink our acoustic arenas. Based on this and on the deformable character of sound mentioned by Ganchrow, it is arguable that sound interacting with reflective material expends while absorption shrinks the physical limitation of the space as perceived by the observer.

One example of applying this theory is by a mapping started with decomposing the space first into elements that produce sound and second to architectural elements that influence the character of sound, such as materials that reflect (amplify) and absorb, producing a wide catalog. This is followed by breaking down the site into spatial compositions – from narrow to wide spaces which influence the character of sound.

From all the inventory mappings, what interested me is how sound interacts with space and how it is able to transform the perceived space by reflection and absorption (similarly to vision) which was tested to represent by different mapping methods such as transcriptions, photograph, collage, spatial narratives, and experimental perspectives.

As a conclusion of the research, on a social level sound is an emotive medium of space. It influences the perception of
space and it shapes or deforms social relationships. Sound is also a *performativity medium* of space (city) that is shaped by its inhabitants and belongs to its inhabitants. Another important spatial aspect of sound can be found in its *interactive character*. Sound interacts not only with the observer, but also with the space itself. Sound by nature belongs to space and therefore to architecture. Sound in space adds multiple dimensions to the built environment such as time, movement (though reverberation) and rhythm. By those characteristics sound is bonded with architecture.

**Research to design**

As sound overlays and adds a new dimension to the space, my choice was to intervene in a form of overlaying an architectural project – an open structure architecture –, on an existing urban site with minimal destruction to its function in a way that possibly enriches its use. Therefore, I chose to implement on a complex (sonically and spatially) urban square which is determined by intense motorized vehicle and pedestrian flow allowing the further investigation of absorption and interaction, as sound is an interactive medium of space resulted from the research.

Taking out of the research the phenomena of absorption and amplification (reflection) in relation to sound and space needed a re-interpretation and was investigated through materiality and spatially with several experimental models. As a conclusion absorption as a physical character of space can be perceived through layering. This layering is spatially defined by solids or by density, which visually defined as visible or invisible layers leading absorption to fading or blurring not only sonically but also visually. In conclusion absorption spatially is layering which intercept or precede the perceived space.

Amplification as a spatial phenomenon was first investigated through the idea of reflection through materiality. The result of using reflective materials to achieve amplification simplified the phenomena of amplification in a spatial level. A further exploration was carried out which lead the idea of amplification in a spatial means to a multiplication or intensification of the same element which is able to amplify (extend) the perception of space in many way. The recurrence of the same architectural element not only amplifies the space but also dissolves its boundaries, and blurs where something begins and ends binding characteristics of the immaterial (sound) phenomena of space to the material one (architecture) into one notion, space, sound and body.

In search for how the seemingly opposing ideas of absorption and amplification can be implemented into a one single design solution (without simply applying materials into the designed space) arose the use of an architectural element, the columns arranged spatially in a manner of repetition and densification, which simultaneously absorbs the space from external influences and amplifies the perceived space in both, sonically and visually.

On a simple component of a grid the design experimented with the application of the seemingly opposite phenomena of absorption as layering (densification), amplification as multiplication and repetition. Implementing fading away and blurring from the nature of sound into an architectural product was an important consideration of the design process. As sound in space is an interactive, emotive and performative medium the design highly focused on combining these three characteristics into one spatial notion: sound, space and body. Based on a maze like structure layering was integrated into the grid forming a field of columns, through which absorption simultaneously occurs with amplification. The spatially intensified and softened columns are also acting as an interactive medium that reacts to any external forces such as body and wind contact, and at the same time blurs boundaries and creates a sense of disorientation similarly as the multiplication of sound does in space (especially in the case of Istanbul). The layering through a labyrinth like structure defined by field of columns on the grid is not only creates the dynamic of the space but also suits the structure for mental organization and delineate the creative method of the design. The structure of the labyrinth, which can be also seen as layering on a grid is a noble dialectic of solids and voids, a constraint or expansion of space allowing solitude and communion with its narrow and wider spatial organization within one space.

From this exploration, the project evolved into a play pavilion with the focus on interaction, emotion and performance of the public. It is an architectural product that highly engages one encountering with the pavilion. It is a project that seeking to become a continues “halt” in a movement (walking by and stand for a moment), or a place to arrive or a place to play and explore one single architectural element that defines solids and voids, body interaction and atmosphere. The project creates a public space that will not only enrich our experience and our relationship with architecture, but also bring social awareness to one another.
Bibliography
