Audio for Virtual Reality
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Introduction

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Hello, my name is Jens Ahrens. And I will be presenting this chapter on Audio for Virtual Reality to you. When you are thinking of virtual reality, one of the first things that might come to your mind is the very passive visuals.

An effect there are 3 D, there are three dimensions, there could be spatial information which is one of the reasons why you might perceive immersion when considering such virtual reality content.

What we will be treating in this chapter is practical solutions that will allow us for correcting the congruent audio rendering

That means you want to render sound including spatial information so that the spatial information that is conveyed through the visuals and the one that is conveyed through audio are congruent, there are no contradictions between them.

So

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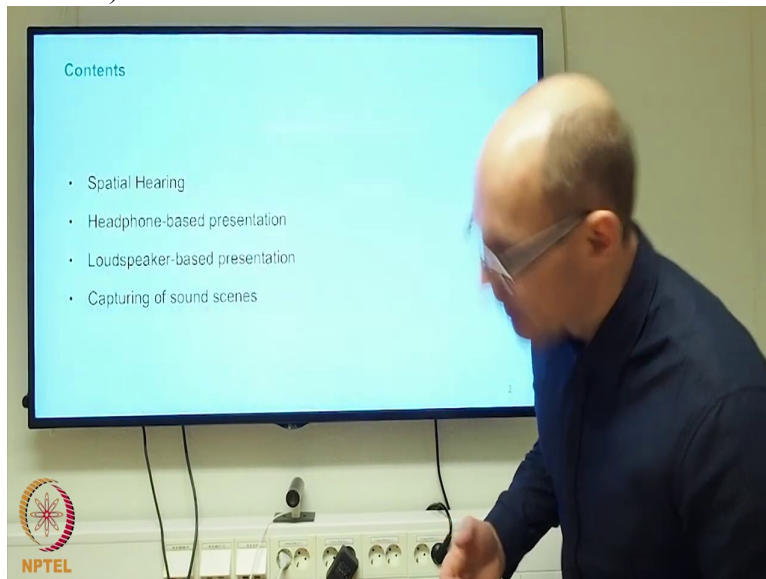
in order for doing this we will first look at the fundamental mechanisms of spatial hearing. That means we will look at those mechanisms inside our auditory system that relates to sensing the location, the position of a sound source. One also speaks of sound source localization.

And then we will look at different solutions and that allow us to trigger exactly those mechanisms and that make us hear sound sources at certain locations. Any of these systems will have to incorporate loudspeakers of some sort.

These loudspeakers they can either be mounted into pair of headphones so that they control

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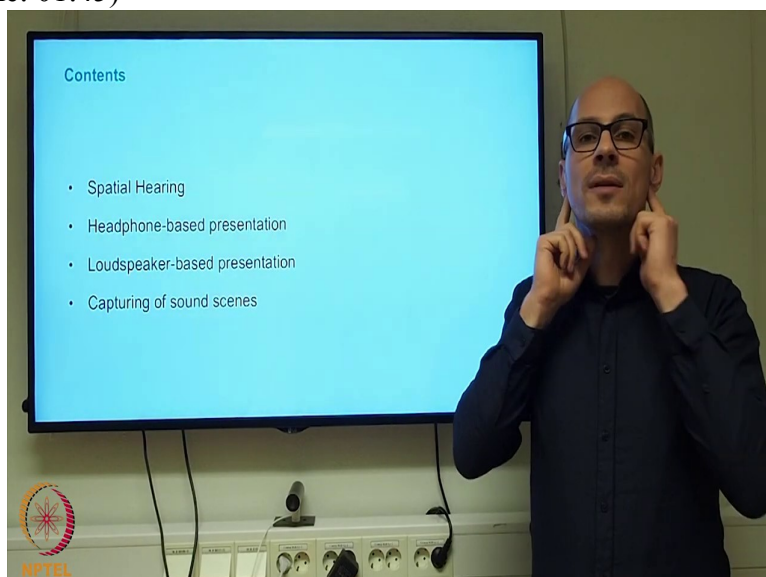
the sound signal that arises at the ears, at the eardrums of the listener directly

Or the loudspeakers can be somewhere located in a room so that this sound that is radiated by these loudspeakers reaches both ears. This is just unavoidable if the loudspeaker is not mounted in a pair of headphones.

And this situation is fundamentally different because we cannot control the ear signals directly or we can only control the sound field around the listener. So we have to design a sound field that leads to the desired ear signals.

Finally towards the end of the chapter we will briefly look at practical solutions that allow us to record, to capture sound scenes including the spatial information so that we can integrate them directly into a virtual reality content without any further post-processing.