



WEB3D 2020

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Tutorial: Extending X3D Realism with Audio Graphs, Acoustic Properties and 3D Spatial Sound Introduction and Overview

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Outline and Presenters

- Introduction and Overview - ***Eftychia Lakka***
- Sound and Acoustics Fundamentals - ***Athanasios G. Malamos***
- X3D4 Tool and Validation Support for Web Audio Graphs- ***Don Brutzman***
- W3C Web Audio API Overview - ***Eftychia Lakka***
- X3D4 Sound model and Validation Examples - ***Eftychia Lakka, All***
- Participants, Questions, Discussion, Future Work - ***All***

Tutorial Title and Summary

- **Title:** “Extending X3D Realism with Audio Graphs, Acoustic Properties and 3D Spatial Sound”
- **Summary:** X3D4 Graphics offers new extensions for the high-fidelity capabilities of Web Audio API, providing advanced 3D spatial sound propagation plus acoustic properties for aural rendering
- **Covered subjects:** Sound propagation and acoustics, [X3D](#) modeling, [Web Audio API](#), and [spatial sound](#)
- **Learning objectives:** Modeling and modifying high-fidelity [advanced audio](#) using Web standards, including [X3D4](#) HTML5 and JavaScript

Tutorial Overview (1)

- Structure of new nodes is suggested in order to extend the X3D specification both with [spatial sound attributes](#) and with [acoustic properties](#) which are involved in sound propagation, such as surface reflection (specular, diffuse) and wave phenomena (refraction, diffraction)
- The strong point of our work is the fact that the proposal is harmonized with [Web Audio API](#), which is the most effective framework for spatial audio in Web (3D) environments, but it does not depend solely on this, as it can be parsed [through others sound libraries](#). Equally important is the additional of acoustic properties ensuring that the quality of 3D scenes can be increased



Tutorial Overview (2)

The tutorial provides

- an overview of fundamentals of [sound](#) and [acoustics](#), the [improved X3D4](#) Sound Component,
- and an overview of the [W3C Web Audio API](#),
- multiple [example scenarios](#) are shared for evaluation of the proposed approach, using the new X3D nodes in an interactive Web 3D scene

Contact

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