ACOUSTICS VISUALIZATION FOR ARCHITECTURAL SPACES

By

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGMENT

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ABSTRACT

Interactive visualization of sound propagation through architectural spaces offers designers an iterative approach to construct spaces with desired acoustical proprieties through changes in geometry and materials within a simulated computer models. We are investigating methods to simulate and visualize sound propagations with interactive frame rates for new geometries with less noise then existing algorithms. Simulating sound wave propagations can be done in real time with existing algorithms, however these algorithms require non real-time pre-computation for each room geometry simulated. Other algorithms that do not require an offline computation step offer results in real time, however yield noisy visualizations, require a large initial sampling, or do not capture all acoustical phenomenons; Extending wave particles, a concept introduced by Cem Yuksel for real time water simulation through hight fields, to simulate the wave front propagations of sound we can offer clear visualizations at interactive frame rates for an iterative designs of room geometries of materials. We created a design tool for architect students that will allow the creation of 3D models and interactive visualizations of sound wave fronts in created spaces given an emitter and receiver. With this toolkit designers will be able to assess the general acoustical properties of a room in the early design phase. Furthermore we support BDRFs found in commercial wall materials that will allow designers to creatively use these to achieve desired acoustical properties.

1. INTRODUCTION

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1.1 A Section Heading

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1.1.1 A Subsection Heading

2. THE NEXT CHAPTER

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APPENDIX A
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A.1 A Section Heading

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APPENDIX B
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