Geometric Sound Transmission
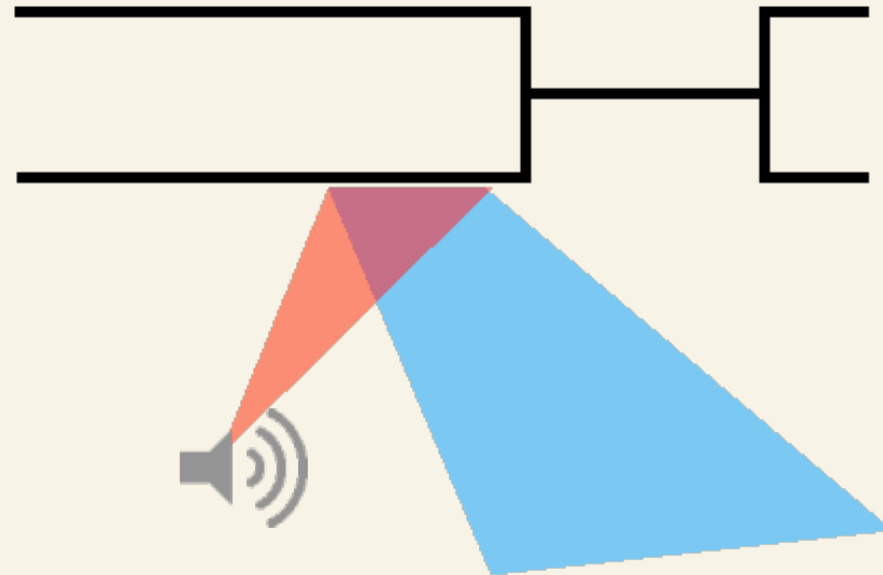
Micah Taylor

Overview

- Geometric propagation
  - Very fast
  - Can be used realtime
- Several propagation methods
  - Reflection
  - Diffraction
  - Transmission

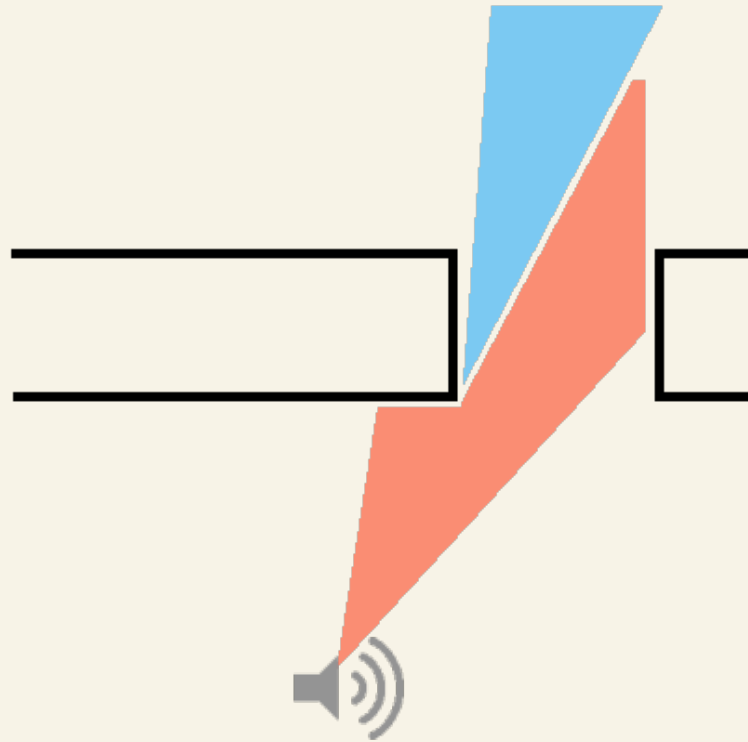# Propagation

- Reflection
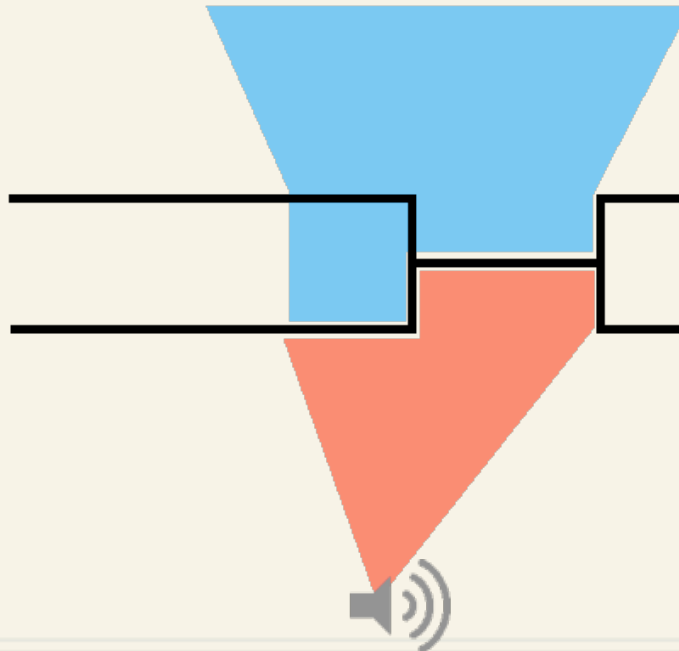 - Primary propagation method
  - Causes echos

Propagation

- Diffraction

  - Sound bends around corners

Propagation

- Transmission
  - Sound travels through materials
  - Hear sounds through walls
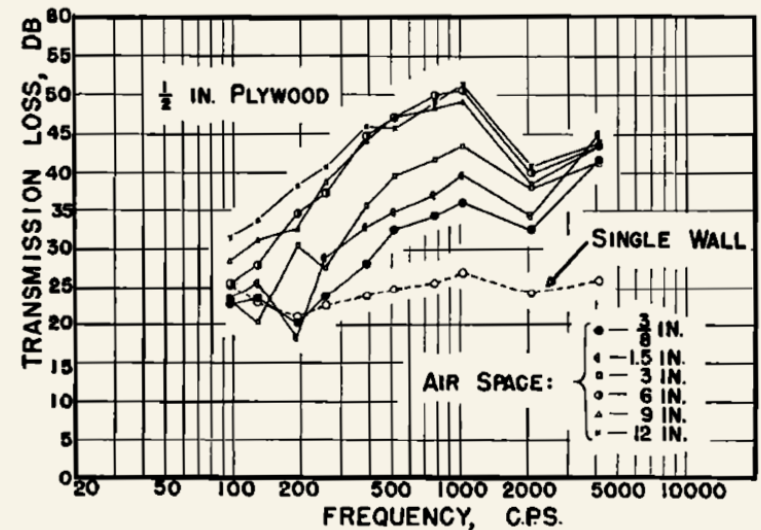
Implementation

- Goals

  - Base on frustum tracing system

  - Add Transmission

  - Add transmission properties

    - Attenuation

    - Refractive properties

  - Support object interiors
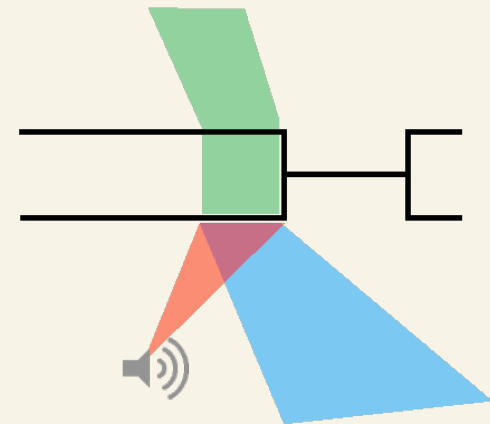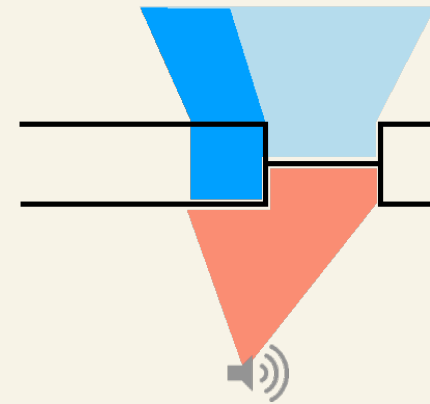
Implementation

- Accomplished
  - Transmission
    - Refraction
    - Pass through
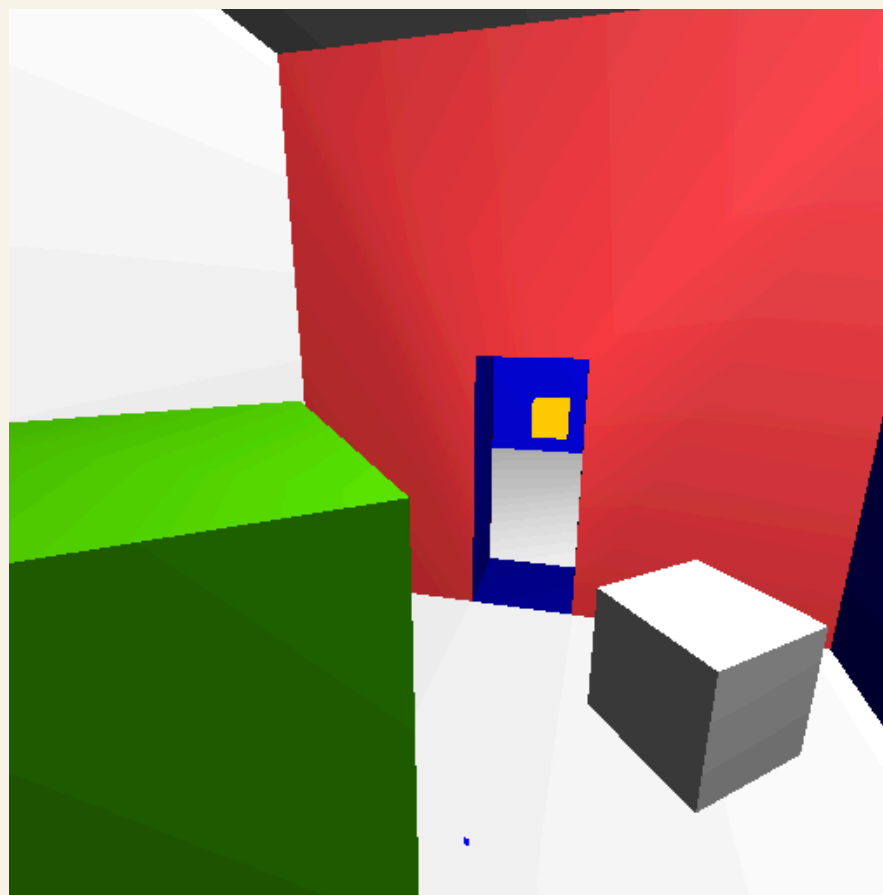 - Single transmission property
- Only supports thin walls

Future work

- Support for interiors
    - Multiple methods of transmission
- Multi-material objects
    - Similar to multitexturing

Demo

Summary

- Adds dimension to simulation

- Important for realism

- Allows much greater awareness

- Slower, but still realtime

References

- Transmission of Reverberant Sound through Double Walls, London A, 1949

- Sound transmission through single plates with absorptive facings, D. Takahashi, 1990