MULTIPOINT SYSTEM FOR VIDEO AND SOUND
100 Cemras and Microphones System

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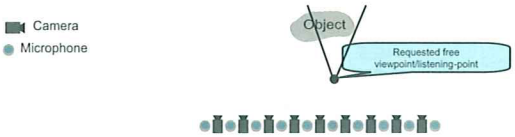
Sever: Xeon 3.60GHz Dual (OS: Windows)
Node: Celeron 2GHz, 256 RAM (OS:Linux)
Camera: PULNiX TMC-1400CL
1392x1040x1(BayerMatrix), 29.411fps
Microphones: Sony ECM-77B
16 Bits 96~8 KS/sec
Network: 1GB BASET
Configurations: Arc, Line, 2D(20x5)

Task: Intergration of 3D Audio & Video for Free Listening-point & Viewpoint Generation

Introduction

This research is aim to represent 3D sound and Image without localization and propose to use ray-space represetation of light rays for sound wave, which is independent of object's specifications, for arbitrary listetening-point generation in 3D space.



Background

Free viewpoint generation methods in different camera density

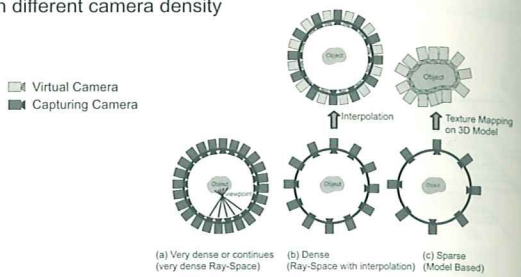
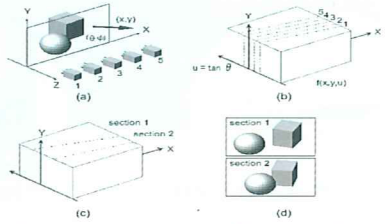


Image Ray-Space

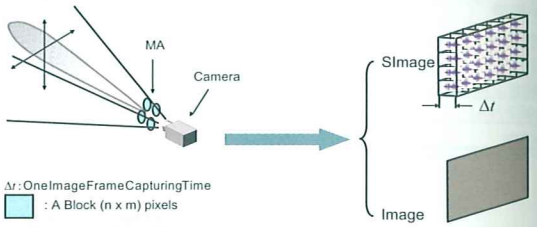
Ray-space representation of light rays:



Sound wave can be processed as Image if it represents in Image format (Sound Image)

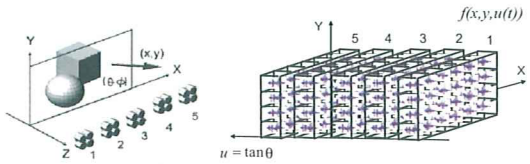
Sound Image (SImage)

SImage Capturing: Scanning the viewing range of a camera with its corresponding Microphone Array (MA)



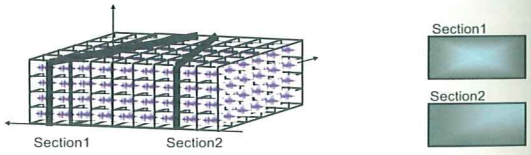
SImage Ray-Space

Capturing SImage Data using Array of Microphone Array and Generating SImage Ray-Space



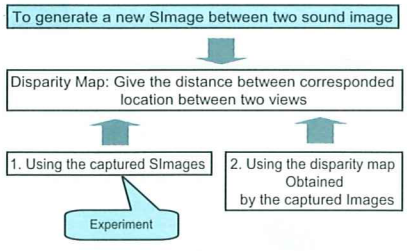
Arbitrary SImage Generation

1. Generating a Dense Ray based SImage data
2. Cut the Ray-space data to generate the virtual SImage

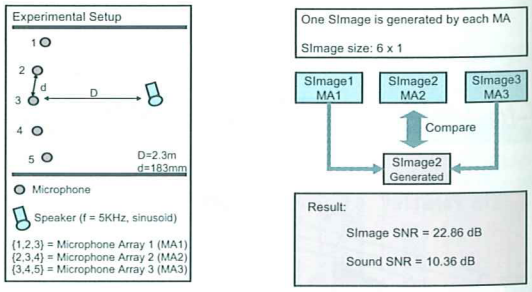


The corresponded sound of an SImage is generated by averaging the sound pixel or block in the SImage.

SImage Interpolation Method



Experiment



Summary

1. Capturing SImage
2. Generating SImage ray-space
   a. Using SImage Disparity
   b. Using corresponded Image Disparity (Future work)
   c. Combination of (a) and (b)
3. Synthensizing arbitrary Listening-point (Future work)
4. Sampling Rate of SImage (Future work)

Conclusion

This research proposed a method to represent the 3D sound field using ray-space method.
The proposed theory can solve the problem of 3D media integration.

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