Sound Intensity Mapping Based on the Manual Scanning Technique

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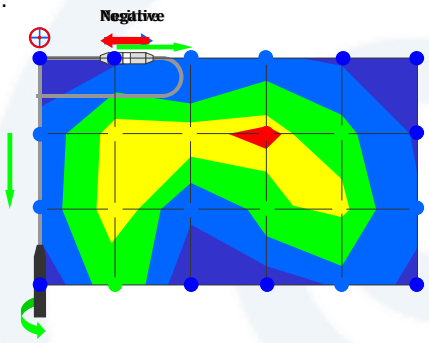
Introduction

- Sound intensity measurements can give the **value** and **direction** of the sound energy.
- Distributing measurements on a 2D grid will make a surface plot of the sound energy.



Limits of Existing Systems

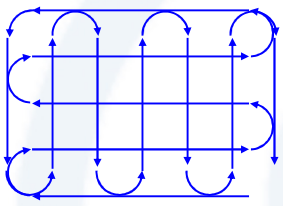
Systems or software developed to produce sound intensity maps are expensive and inappropriate for in the field measurements.

- Inconvenient grids or large mechanical equipments.
- Background picture superposition is made with poor results.
- Requires a lot of data manipulation.
- Setup time is long.

Proposed Method

The proposed method is to provide a map resulting from the ISO 9614-2 scanning technique for intensity measurement.

- Standard scanning technique provides a grid pattern.



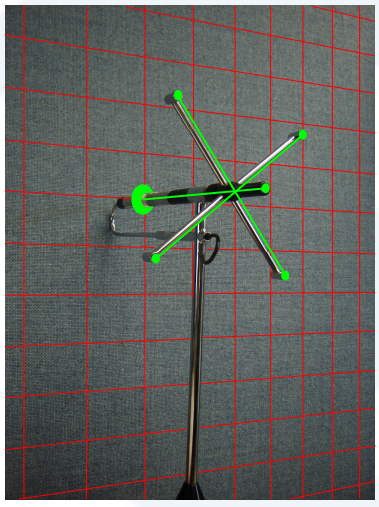
- A map is produced by associating probe coordinates and intensity measurements along the scanning path.

Key Elements

- Position Tracking Method.
- Intensity Measure Blocks Representation.
- Map Construction.

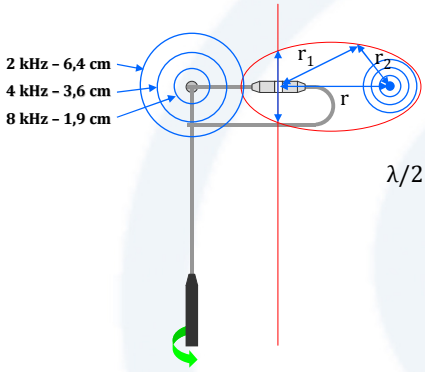
Position Tracking Method

The position tracking device is based on machine vision techniques.



Intensity Measure Representation

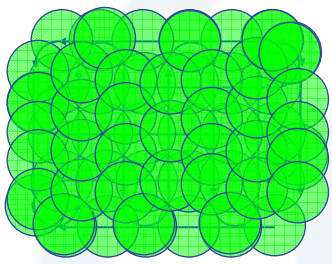
Intensity block representation is based on the Fresnel ellipse.



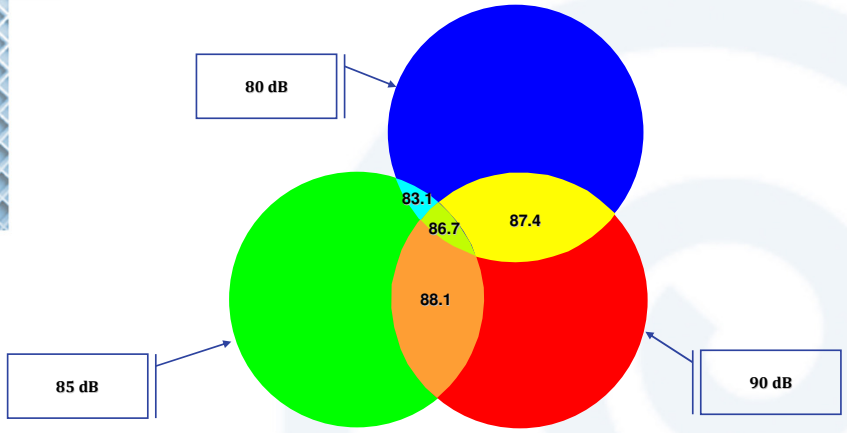
$\lambda/2 = r_1 + r_2 - r$

Map Construction

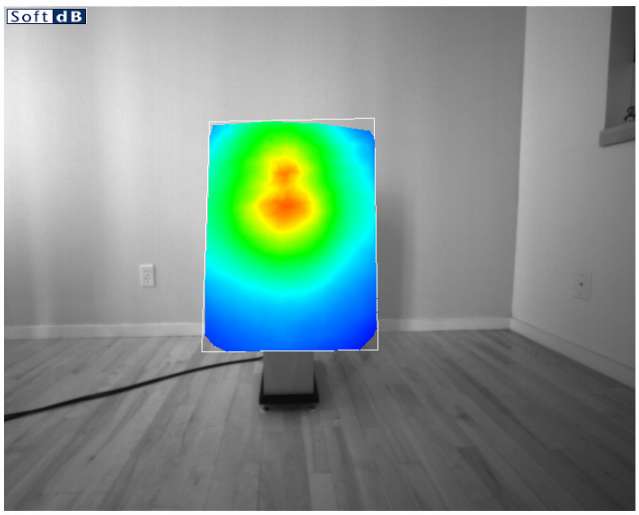
Measure blocks and coordinates are combined during the scanning to build the map.



Computing Method – Spatial Averaging

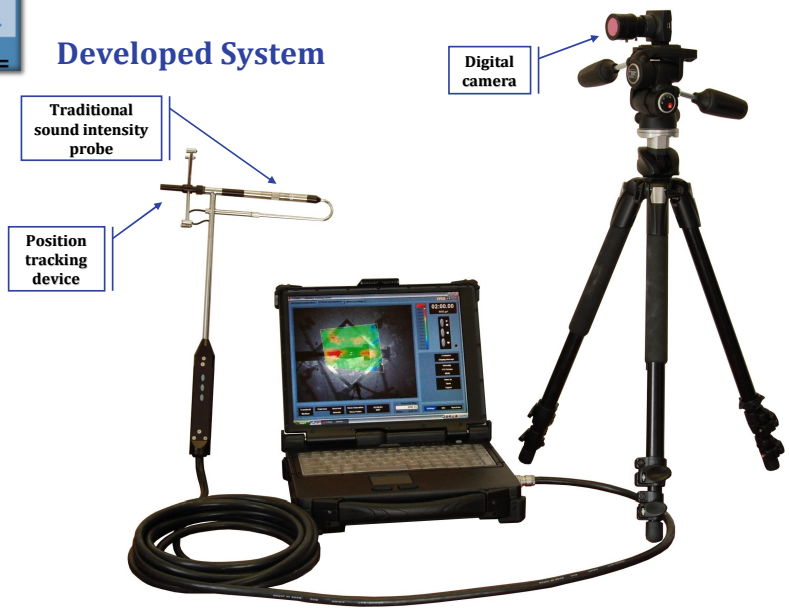


Results – Map view Opaque



Spectrum Bands 12,5 kHz

Developed System



Conclusion

A sound mapping method was developed using standard scanning technique and machine vision

- **Fast mapping implementation**
- **Ease of use**
- **Fast results**
- **Easy results interpretation**

Any Questions?