The SCENIC Project: Environment-Aware Sound Sensing and Rendering

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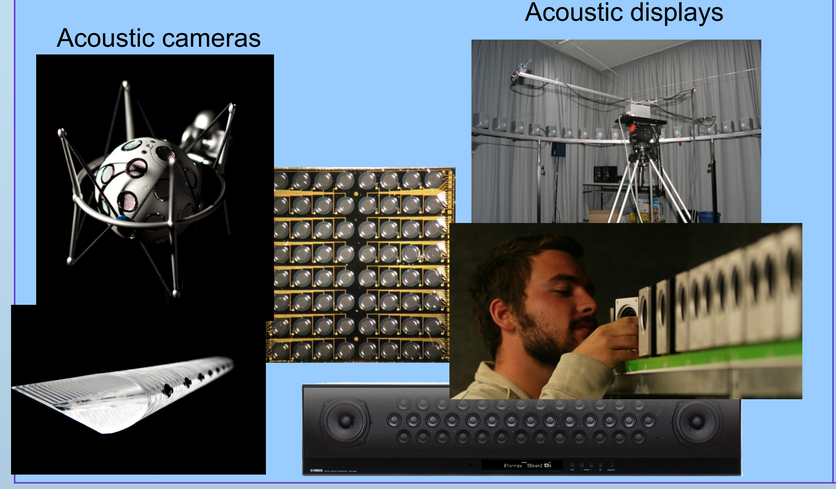
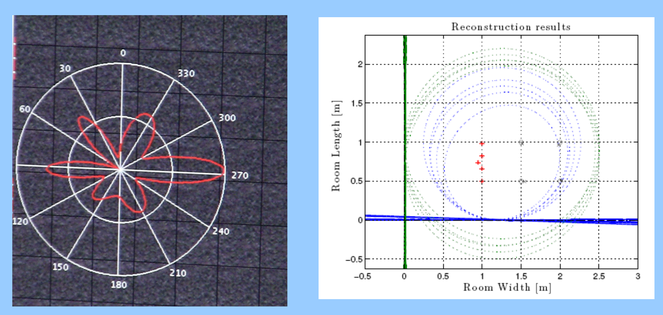
Objectives

Develop advanced space-time processing techniques that jointly use acoustic cameras and acoustic displays for

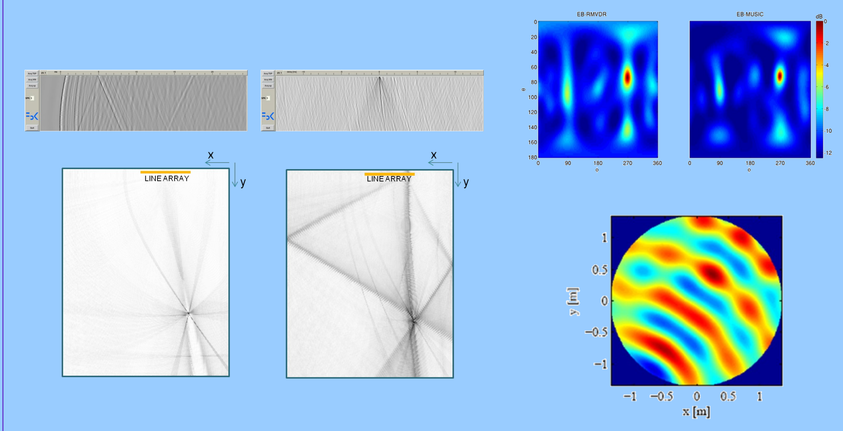
Probing and sensing the acoustic environment



Inferring and reconstructing the acoustic scene

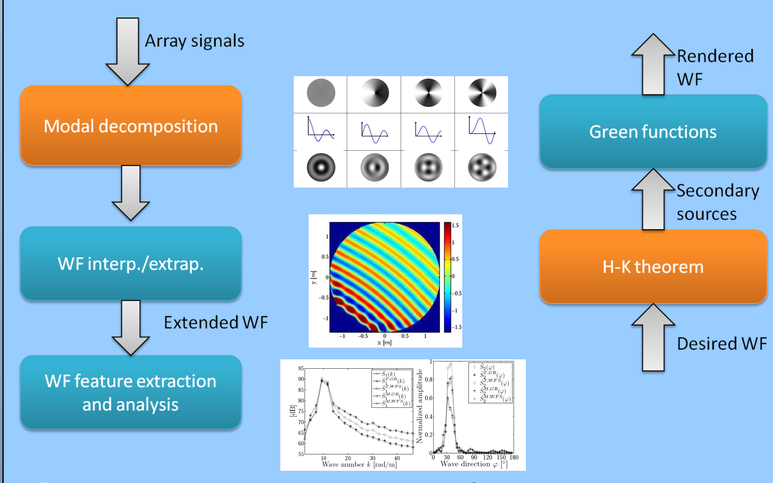


Environment-aware sensing and rendering



Methodologies

Modal Wave Field approach

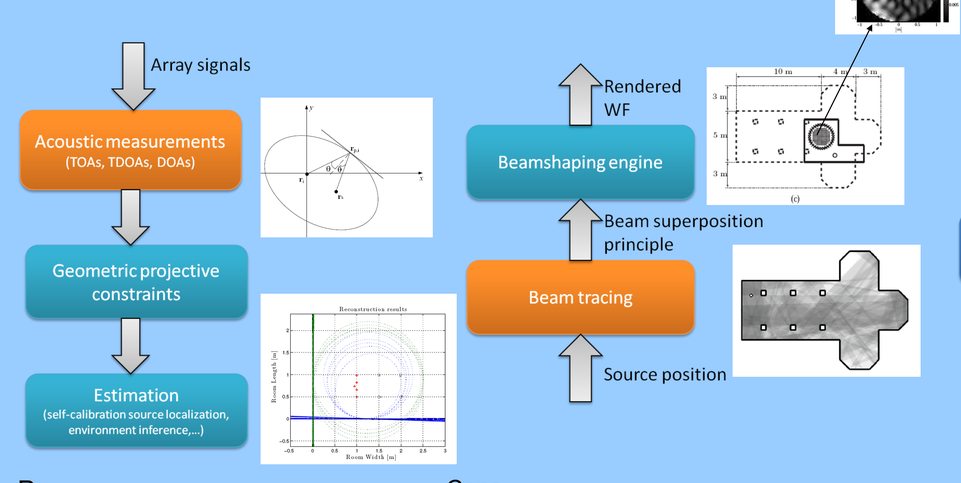


Pros:
- We can easily decide the accuracy of modal description
- Well-established in the literature

Cons
- acquisitions that comply with Shannon's theorem (in space) are demanding

Knowledge of the environment can improve the accuracy of modal WF methodologies

Geometric Wave Field approach

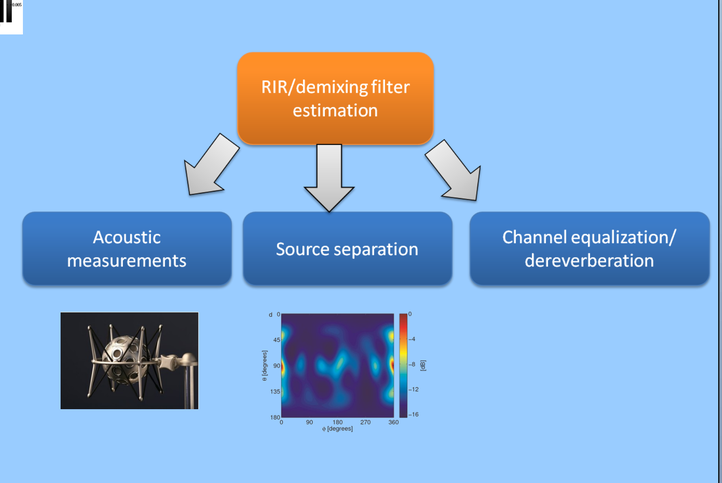


Pros:
- Very compact representation of the wavefield
- Direct link with acoustic measurements
- Reflectors are treated as part of the acoustic system

Cons
- Approximations are needed when dealing with wall diffusion
- Modal behavior (resonances) not easy to represent

An integration with global WF methodologies is desirable

Channel-based approach



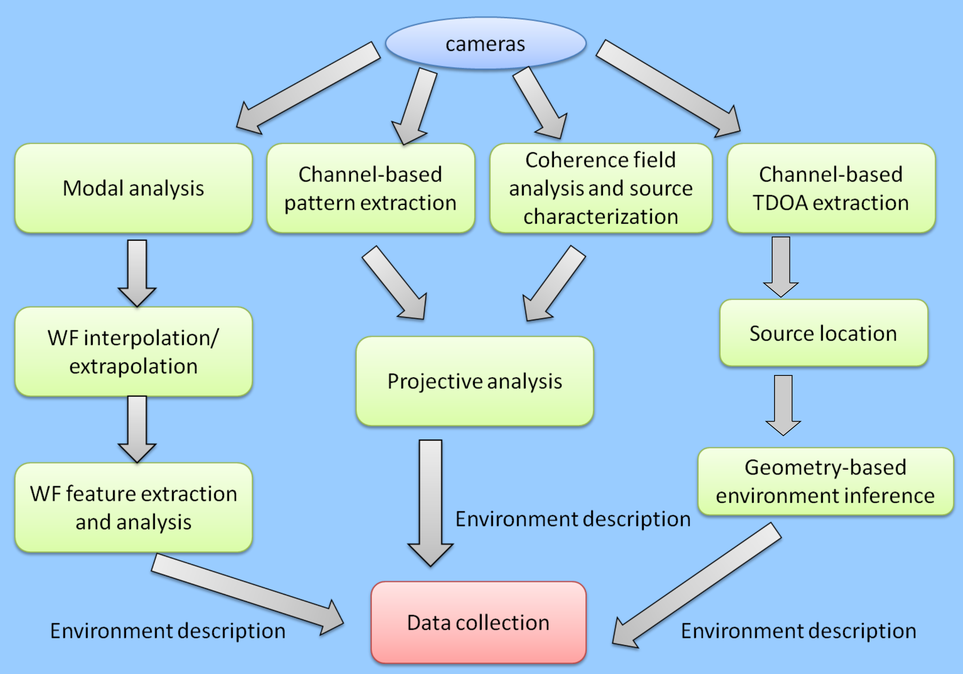
Pros:
- Very flexible: can take advantage of the results of both WF methodologies, also can boost performance of both WF methodologies

Cons
- Some details about the complete WF could be lost in the synthetic description

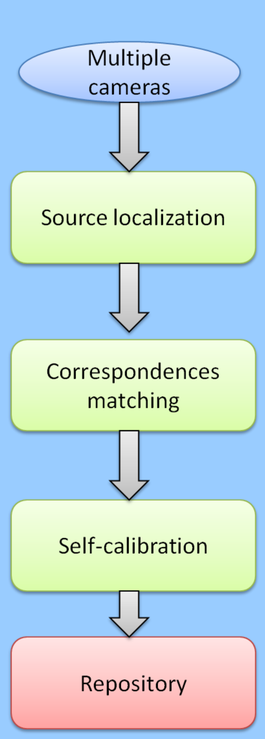
Useful the most when integrated with global WF solutions

Synergies

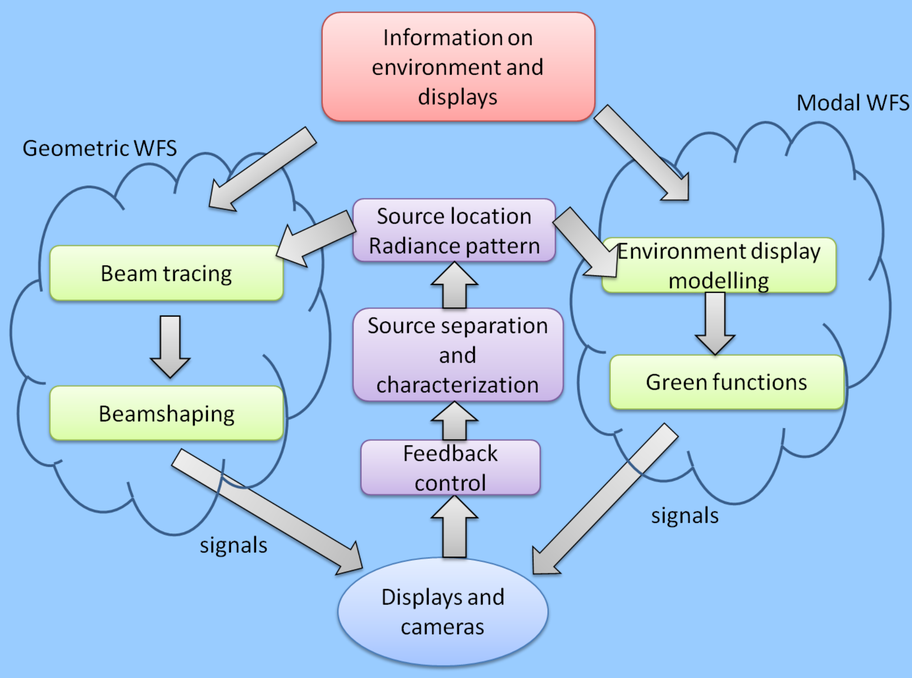
Environment awareness (acoustic scene reconstruction)



Self-awareness (self-calibration)



Environment-aware rendering



SCENIC

SEVENTH FRAMEWORK PROGRAMME