SYLLABUS

Acoustic Array Signal Processing

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COURSE DESCRIPTION

This course covers theory, implementation, and application of acoustic array systems of microphones and loudspeakers. Estimation of direction of arrival and beamforming using acoustic arrays are discussed. Both nearfield and farfield arrays are introduced in the context of sound field analysis and synthesis.

TOPICS

1. Introduction
2. Theoretical Preliminaries of Acoustics
3. Theoretical Preliminaries of Signal Processing
4. Farfield Array Signal Processing Algorithms
5. Nearfield Array Signal Processing Algorithms
6. Practical Implementations
7. Application Examples
8. Concluding Remarks and Future Perspectives

GRADING POLICY

HW	60%
Final report	40%
	100%

TEXTBOOK

1. Bai, M. R., Ih, J. G, and Benesty, J., 2013, *Microphone Array Systems*, IEEE/Wiley, Singapore.

REFERENCES

1. 白明憲, 2008, 工程聲學, 全華科技圖書公司, 台北。
2. Kinsler, L. E., Frey, A. R., Coppens, A. B., and Sanders, J. V., 1982, *Fundamentals of Acoustics*, John-Wiley, New York.
3. V. Oppenheim and R. W. Schafer, Discrete-Time Signal Processing, Prentice-Hall, Englewood Cliffs, NJ, 1989.
4. H. L. Van Trees, Optimum Array Processing, Wiley-Interscience (2002).