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| |  | | --- | | **Course Information** |  |  |  | | --- | --- | | Course title | Adaptive Signal Processing | | Semester | 109-1 | | Designated for | COLLEGE OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE  GRADUATE INSTITUTE OF COMMUNICATION ENGINEERING | | Instructor | [CHUN-LIN LIU](https://nol2.aca.ntu.edu.tw/nol/coursesearch/teacher.php?op=s2&td=901195) | | Curriculum Number | EE5027 | | Curriculum Identity Number | 921 U1170 | | Credits | 3.0 | | **Course Syllabus** | | | **Please respect the intellectual property rights of others and do not copy any of the course information without permission** | | | Course Description | 1. Wiener filter 2. Linear prediction 3. Least-mean-square adaptive filters 4. Basics of array signal processing 5. Beamforming 6. MUSIC and ESPRIT algorithms 7. Kalman filters | | References | [1] F. Maloberti and A. C. Davies, Eds., A Short History of Circuits and Systems, River Publishers, 2016. Available at http://ieee-cas.org/short-history-circuits-and-systems. The history of adaptive filters and adaptive signal processing was reviewed in pp. 85-96.  [2] B. Widrow and S. D. Sterns, Adaptive Signal Processing, Prentice-Hall, 1985.  [3] S. Haykin, Adaptive Filter Theory, Fourth Edition, Prentice Hall, 2001.  [4] A. H. Sayed, Adaptive Filters, John Wiley & Sons, 2008. (https://doi.org/10.1002/9780470374122)  [5] T. Kailath, A. H. Sayed, B. Hassibi, Linear Estimation, Pearson, 2000.  [6] P. P. Vaidyanathan, The Theory of Linear Prediction, Synthesis Lectures on Signal Processing, Morgan and Claypool Publishers, 2008.  [7] D. H. Johnson and D. E. Dugeon, Array Signal Processing: Concepts and Techniques. Addison Wesley Pub. Co. Inc., 1993.  [8] H. L. Van Trees, Optimum Array Processing: Part IV of Detection, Estimation, and Modulation Theory. Hoboken, NJ, USA: Wiley, 2002. |  |  | | --- | | **Progress** |  |  |  |  | | --- | --- | --- | | Week | Date | Topic | | 第1週 | 9/16 | Course introduction; stochastic processes and models | | 第2週 | 9/23 | Stochastic processes and models | | 第3週 | 9/30 | Wiener filters | | 第4週 | 10/07 | Wiener filters | | 第5週 | 10/14 | Linear prediction | | 第6週 | 10/21 | Linear prediction | | 第7週 | 10/28 | LMS adaptive filters | | 第8週 | 11/04 | LMS adaptive filters | | 第9週 | 11/11 | Midterm exam | | 第10週 | 11/18 | Adaption with vector random processes; array processing | | 第11週 | 11/25 | Adaptive beamforming | | 第12週 | 12/02 | Adaptive beamforming | | 第13週 | 12/09 | Subspace methods | | 第14週 | 12/16 | Subspace methods | | 第15週 | 12/23 | Kalman filtering | | 第16週 | 12/30 | Kalman filtering | | 第17週 | 1/06 | Nonuniform sampling or other advanced topics | |

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