Hokkaido University Syllabus					
Course Title					
Adaptive Communications					
Subtitle					
Instructor (Institution)					
Toshihiko NISHIMURA(Graduate School of Information Science and Technology)					
Other Instructors (Institution)					
Takeo OGANE(Graduate School of Information Science and Technology) Toshihiko NISHIMURA(Graduate School of Information Science and Technology)					
Course Type				Open To Other Faculties / Schools	OK
Year	2018	Semester	2nd Semester (Winter Term)	Course Number	046061
Type of Class	Lecture	Number of Credits	2	Year of Eligible Students	～
Eligible Department / Class				Other Information	
Numbering Code	IST_MN 6130				
Major Category Code	Major Category Title				
IST_MN	Graduate School of Information Science and Technology(Media and Network Technologies)				
Level Code	Level				
6	Specialized Subjects (advanced) in graduate level (Master's Course and Professional Course)				
Middle Category Code	Middle Category Title				
1	Information communication systems				
Small Category Code	Small Category Title				
3	Adaptive communication				
Language Type					
Classes are in Japanese.					

Key Words

mobile phone, adaptive signal processing, LTE, 5G

Course Objectives

Communication systems are required to track quality and/or demand transition due to change in wireless environments, for example, in mobile radios. Adaptive signal processing in the time, frequency, space, and code domains is very important and thus is implemented in many systems. In this course, several signal processing techniques are introduced.

Course Goals

Our goal is to get a capability applying existing techniques to other fields based on the knowledge how they have been applied to actual communication systems.

Course Schedule

(1-5) adaptive control in MAC layer
data off-loading, automatic repeat request (ARQ), adaptive modulation and coding, transmit power control, non-orthogonal multiple access, and scheduling

(6-11) adaptive signal processing in the time and frequency domains
adaptive filtering, frequency domain equalization

(12-15) adaptive signal processing in the space domain
MIMO signal processing and space-time codes

Homework

Home work may be given. It is highly recommended to study at home as well as in the class.

Grading System

At the end of the course, students must submit a report on a topic chosen by Instructor. The course grade is determined by the report score.

Textbooks

Reading List

Websites

Website of Laboratory

Additional Information

It is assumed that credits on Information theory, Signal processing, and Communication systems have been earned in universities.

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