Syllabus 2019 Applied Information Sciences

Applied Data Sciences

■ Basic information

| held this year: | yes |
| instructor(s) | Applications to information science: Takeshi Obayashi, Kazunori Yamada, Mitsuyuki Nakao Applications to economics: Yoshihiro Yajima Applications to biology and ecology: Shusei Sato, Takashi Makino, Jun Hidema, Masakado Kawata |
| room | Mid Lecture Room |
| schedule | The first half year (Tuesday) 14:40-16:10 |
| begins on: | 04/09 |

■ Objectives and outline

Purpose
In addition to numerical analysis and computer science as the academic foundations, practically what kind of problem is solved in what way based on the data science is essential. To acquire such a problem-solving ability is the purpose of this course.

Overview
The course includes an introduction to linear regression models with applications to economics, and data science in biology and ecology, each of which is taught by the expert lecturers.

Objectives
Students learn about:
1. applied fields of data science
2. ways of application of data science in each field

■ Class plan

Biological and ecological applications of data science
4/9 Advance of the technologies producing biological Big Data (Shusei Sato)
4/16 Examples application of biological Big Data (Shusei Sato)
4/23 Comparative genomics (Takashi Makino)
5/7 Analysis of the data related to environmental adaptation of plants (Jun Hidema)
5/14 Analysis of the data related to evolution of biodiversity and ecology (Masakado Kawata)
5/23 TBA (Takeshi Obayashi)
5/28 TBA (Takeshi Obayashi)

Introduction to linear regression models with applications to economics
6/4 Simple regression (Yoshihiro Yajima)
6/11 Multiple regression (Yoshihiro Yajima)
6/18 Least squares method (Yoshihiro Yajima)
6/25 t-test (Yoshihiro Yajima)
7/2 Applications to empirical analysis in economics (Yoshihiro Yajima)

Application of mathematical optimiztion
7/9 Dynamic programming (Kazunori Yamada)
7/16 Neural network (Kazunori Yamada)
7/23 Support vector machine (Kazunori Yamada)

■ Evaluation

Evaluation is done comprehensively based on short tests and assignments.

■ Textbook(s)

Textbook: not used.
Related literature: If necessary, specified in the lecture.

■ Web site

■ Office hours

Office hour is not scheduled. If a student wants to see a lecturer, make an appointment in advance via e-mail or other means. The contact information will be given in the class.

■ Other information

Students are required to review and prepare for each class based on the materials distributed in the class.