Guide to Information Statistics II（情報統計特論 II）

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(The photo shown right is displayed on the door of Asano's room)

OFFICE HOURS: 5th and 6th periods on Thu.
Asano is sure to be present in his room in this period.

Contents of this course

The concept and applications of the mathematical morphology will be outlined. The mathematical morphology is a basic concept of quantitative image analysis. It describes many kinds of operations on images by simple and formal way, and has many applications. In this lecture, the concept of size distribution and the application to optimization of image filters will be also explained.

Score evaluation

A final report will be required.

Schedule (Details can be changed)

Part I. Mathematical morphology

Lecture 1. (Oct. 6) Guidance, Introduction to digital image processing and mathematical morphology
Lecture 2. (Oct. 13) Basic operations of mathematical morphology
Lecture 3. (Oct. 20) Grayscale morphological operations
Lecture 4. (Oct. 27) Properties of morphological operations
(Nov. 3) (National holiday)
Lecture 5. (Nov. 10) Granulometry
Lecture 6. (Nov. 17) Skeleton and mathematical morphology
Lecture 7. (Nov. 24) Opening transform
Lecture 8. (Dec. 1) Morphology on lattice, morphology on color images

Part II. Image filtering

Lecture 9. (Dec. 8) Image filtering, nonlinear image processing filters
Lecture 10. (Dec. 15) Threshold decomposition and logical filter family

Lecture 11. (Dec. 22) Morphological filters
Lecture 12. (Jan. 12) Outline of artificial neural networks
Lecture 13. (Jan. 19) Filter optimization by supervised and unsupervised learning

Part III. Current topics
Lecture 14. (Jan. 26) Morphological texture classification and modelling
Lecture 15. (Feb. 2) Other current topics
(Feb. 9) (Reserved)

References

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J. Serra, Introduction to Mathematical Morphology, Comput. Vision Graphics Image Process, **35,** 283-305 (1986).

P. Maragos, Tutorial on advances in morphological image processing and analysis, Optical Engineering, **26,** 623-632 (1987).

R. M. Haralick, S. R. Sternberg, and X. Zhuang, Image Analysis Using Mathematical Morphology, IEEE Trans. Pattern Anal. Machine Intell., **PAMI-9,** 532-550 (1987).

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WWW services

Information about this lecture is available on the following WWW page:

`http://kuva.mis.hiroshima-u.ac.jp/~asano/Kougi/00a/InfstatII/`

Akira ASANO

Oct. 6, 2000