

Information Theory

Instructor :

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Text :

There is no *required* text. A set of copyrighted class notes will be provided in installments. You can obtain the latest version of the lecture notes from

<http://shannon.cm.nctu.edu.tw/it.htm>

The following is a list of *recommended* texts:

1. *A Student's Guide to Coding and Information Theory*, Stefan M. Moser and Po-Ning Chen, Cambridge University Press, January 2012.
2. *Elements of Information Theory*, Thomas M. Cover and Joy A. Thomas, 2nd edition, John Wiley & Sons, Inc., July 2006.
3. *A First Course in Information Theory (Information Technology: Transmission, Processing, and Storage)*, Raymond W. Yueng, Plenum Pub Corp., May 2002.
4. *Principles and Practices of Information Theory*, Richard E. Blahut, Addison Wesley, 1988.
5. *Information Theory and Reliable Communication*, Robert G. Gallager, 1985.

6. *Information Theory*, Robert B. Ash, Dover Publications, Inc., 1965.
7. *Mathematical Foundations of Information Theory*, A. I. Khinchin, Dover Publications, Inc., 1957.

Grading System :

Your semester grade will be contributed equally by the *midterm exam*, the *final exam*, and a *written report* on a self-selected paper on *IEEE transactions on Information Theory*.

A list of the key factors that affect your grade of the report is provided below.

- 50% will be emphasized on your answers to the following two questions:
 - (1) What is the problem the paper tried to solve (Problem formation)?
 - (2) What is the achievement or the conclusion of the paper?
- 50% will be contributed from:
 - (3) Technical background dated back to the time the paper was written. (Some students may select a very old paper, so some of the problems may already have a better solution than the one proposed in the paper. Hence, the technical background dated back to the time the paper was written is important.)
 - (4) The key idea (on which the solution is based) proposed in the paper.
 - (5) Something, in your opinion, needs to be further explored.
 - (6) Personal comments on the paper.
 - (7) Any potential applications.
 - (8) Any potential future extensions.
- Please note that a written report that selectively copies the sentences from the paper is not preferred. I will appreciate more to a written report that is full of “your own words.” Hence, it is suggested that you read the paper several times, dig into its details, collect the thoughts, and then put the paper aside before you start to write the report.

Please be noted that the selected paper has to be one that is published on IEEE transactions on Information Theory. Papers published in other journals are not acceptable in this course.

Lecture Schedule :

- The first lecture will be given on **September 26**.
- You need to submit the *title, authors, page numbers, month* and *year* of the paper you select for reporting by the end of **November 7** lecture. I will then post the list of papers being selected on my website two days after. Students who fail to submit his/her choice in time will be deducted **50%** from his/her *paper study* grade.
- Some students may not like to select a paper that others have selected, so you can switch to other paper at any time before the end of **November 28** lecture. I will constantly update the list on my website so that the most recent choices are always posted. Note that **November 28** will be a strict deadline for the submission of the paper title that you wish to study.
- There will be no lecture on **September 19** and **October 10** because they are holidays.
- **Midterm** will be held on November 14. The coverage of midterm will be decided later.
- The last lecture will be given on **January 9, 2014**.
- **Final exam** will be held on **January 16, 2014**.
- The written report will be due on **January 9, 2014**. You shall submit it before the lecture ends.