

A Random Walk in Information Theory, Combinatorial Optimization, and Statistical Physics

Instructor: Prof. Jun Chen (ITB-A221, junchen@ece.mcmaster.ca).

Prerequisite: Basic knowledge of probability theory, linear algebra, and real analysis.

Office Hour: Available upon appointment.

Lecture: Thursday 2:30 PM - 5:30 PM, ITB-A311.

General Description:

This is a graduate level course on some central topics in information theory, combinatorial optimization, and statistical physics. The emphasis is on the conceptual and technical connections underlying some of the most spectacular recent progress in these three fields.

No formal homework assignments, no exams. Instead, each student is expected to present a selected topic from the textbook.

Textbook:

1. M. Mézard and A. Montanari, *Constraint Satisfaction Networks in Physics and Computation*, to be published Oxford University Press.

The electronic version is available at <http://www.lptms.u-psud.fr/membres/mezard/>
(or <http://www.stanford.edu/~montanar/BOOK/book.html>).

References:

1. T. M. Cover and J. A. Thomas, *Elements of Information Theory*, New York: Wiley, 1991.
2. D. Mackay, *Information Theory, Inference, and Learning Algorithms*, Cambridge University Press, 2003.
The electronic version is available at
<http://www.inference.phy.cam.ac.uk/mackay/itila/book.html>
3. T. Richardson and R. Urbanke, *Modern Coding Theory*. The electronic version is available at <http://lthcwww.epfl.ch/mct/index.php>