MAT 385 Probability Theory (Fall 2017)

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Class time 1:30 - 2:50 on Mondays and Wednesdays at 601 Fine Hall.

Office hours
Monday 12:00-1:30 or by arrangement. Room 405 Fine Hall.

Course Description

An introduction to probability theory. The course begins with the measure theoretic foundations of probability theory, expectation, distributions and limit theorems. Further topics include concentration of measure, Markov chains, martingales and Brownian motion.

Grading

The grade for the course will be made up of problem sets (50%) and a final take home exam (50%) after scaling.

Probability is a subject where actively working on problems is essential to your understanding of the material, it is not enough simply to listen in class or read the text. There will be a weekly problem set which will be posted each Wednesday (starting September 20) on blackboard and will be due the following Wednesday. These can be done in groups of up to 3. You should list which students you worked with on the problem set. Each of you should write your own solutions separately - this is important to make sure you understand the solutions yourself. I also strongly encourage you to try the problems yourself first before working with your group.

There will be a take home final exam covering all the material of the course. This must be done individually and may be taken during any 48 hour period between January 17 and January 22.

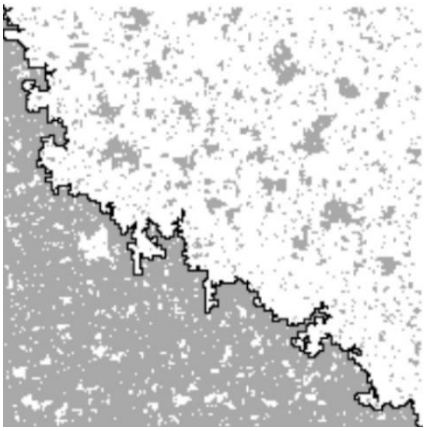
Text Books

We will use the text Theory of Probability and Random Processes by Koralov and Sinai. You can access a free to download copy through the library website. We will cover most of chapters 1-10.

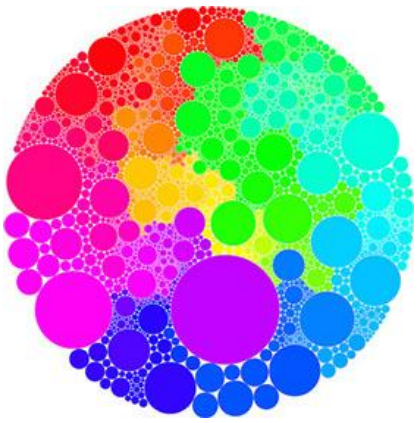
Other texts which may be useful

- Probability: Theory and Examples by Rick Durrett.
- A Course in Probability Theory by Kai Lai Chung

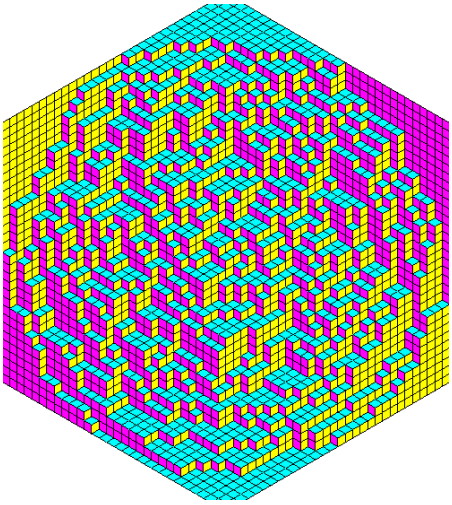
Advanced topics in probability (some things we won't be covering in this course)



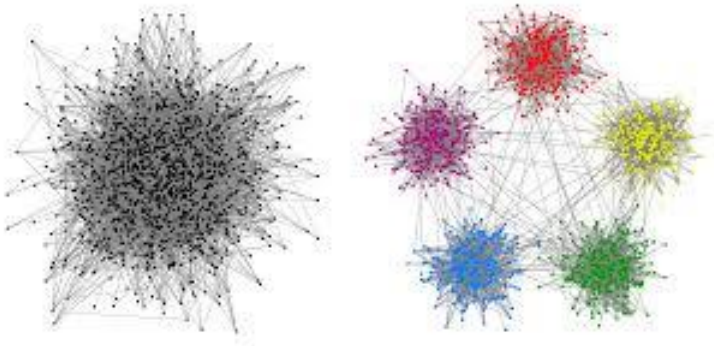
SLE interfaces – Ising Model



Embeddings of random planar maps



Exactly solvable models - Random Tilings



Random Graphs & Network Inference

These are some of the cutting edge topics in modern. We won't be able to cover these topics in this course but it should get you towards the point where you can start learning about them.

Imagines by (clockwise from top left) Hugo Dumnil-Copin, Jason Miller, Emmanuel Abbe, Rick Kenyon