Suggested Project Topics

Here are some suggested research problems that you can consider to work on for your course project. The problems have rather general descriptions, with no specific requirement on what you must achieve. They serve as initial motivations for you to perform deeper investigations on the problems or on related problems of your own interests.

1. (Study of the BPP model) You can study the relationship between a weaker BPP-model, which has a success probability $1/2 + \epsilon$ for a constant $\epsilon > 0$, and the model with success probability $\geq 3/4$ as we defined in class. You can also study how a randomized algorithm that can only generate binary random bits implements a 3-way random step.

2. (Randomized Set-Splitting) Study Chen-Lu’s randomized algorithm for the SET-SPLITTING problem, and try to develop a faster randomized algorithm for the problem.

3. (Color-coding) Find a problem of your own interests (e.g., the problem or part of the problem of your thesis research), and try to use the color-coding technique to develop a randomized algorithm to solve the problem.