Week May 29, 2018

Kaiyan Shi

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Tuesday

1. Advanced composition theorem: For all $\epsilon, \delta, \delta' \leq 0$, the class of (ϵ, δ)-differentially private mechanisms satisfies $(\epsilon', k\delta + \delta')$-differential privacy under k-fold adaptive composition for:

$$\epsilon' = \sqrt{2kln(1/\delta')}\epsilon + k\epsilon(e^{\epsilon} - 1).$$

All terms and concepts related to advanced composition theorem.

2. The spare vector technique, including AboveThreshold Algorithm, Sparse Algorithm and NumericSparse Algorithms. They are all (ϵ, δ)-differentially private and (α, β) accurate.

3. Finish Week 1's problems. I still have some problems left, but most of them are done.

4. Carefully read and understand all details in the differentially ANOVA paper.

Wednesday

1. Read differentially private paper. I skim through or carefully read (with * in front)

a. *https://arxiv.org/abs/1511.03376 Revisiting Differentially Private Hypothesis Tests for Categorical Data

b. *https://arxiv.org/abs/1610.07662 A New Class of Private Chi-Square Tests

c. https://arxiv.org/abs/1709.07155 Local Private Hypothesis Testing: Chi-Square Tests

d. https://arxiv.org/abs/1602.03090 Differentially Private Chi-Squared Hypothesis Testing: Goodness of Fit and Independence Testing

Thursday

1. I present the paper a (listed above) and listened other paper presentations.

a. http://proceedings.mlr.press/v70/kakizaki17a/kakizaki17a.pdf Differentially Private Chi-squared Test by Unit Circle Mechanism

b. above c

c. Privacy preserving GWAS data sharing

2. Decide which topic we want to do for research: non-parametric tests or likelihood ratio tests.

Friday

1. Decide that we will work on non-parametric tests and have a plan about the following week.

2. Be familiar with non-parametric tests like Wilcoxon Signed-Rank test, Mann Witney test and Kruskal?Wallis test.

3. Carefully read the paper https://epubs.siam.org/doi/pdf/10.1137/1.9781611974348.18 Differentially Private Significance Testing on Paired-Sample Data and work through all the details to try our best to understand.