

5th Milestone Report for 15-400, Spring 2017

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Major Changes :

There have been no major changes.

Accomplishments So Far :

1. We have been focusing on the problem of recovering (α, β) -clusters in ‘nice’ graphs - the most natural niceness condition is bounded degree, and we explored this question for a while.
2. It turns out that the problem of finding (α, β) -clusters in graphs with $O(\log n)$ -bounded degrees can be solved in polynomial time, and this is just a special case of Balcan et al’s results - this was slightly disappointing, since I spent about a week trying to figure out if this case can be solved.
3. The next natural question is whether we can break Balcan et al’s quasipolynomial ‘hardness bound’ for sparse clusters by stipulating that sparse clusters are actually random samples of dense clusters. I’m currently working on solving this case.

Meeting The Milestone :

I partially met the milestone since we answered an interesting question (albeit as a special case of an existing result). The new problem is certainly more promising.

Surprises :

The only unpleasant realization that the problem I thought was new was actually just a special case of the results I’ve been trying to extend. Alas!

Resources Needed :

I haven’t felt the need for any more non-trivial resources so far.