A Post-Quantum Associative Memory

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COMMENTS TO THE AUTHOR(S)

In the revised version, the authors added a new result, showing that the minimal dimension of the GPT that can contain large sets of mutually N-distinguishable elements has the same scaling for any N and therefore exponentially outperforms classical or quantum theory. This significantly extends the previous version, where this was proved for N=2. The proof idea is based on nonconstructive probabilistic method and is quite ingenious. Although a construction of an explicit GPT of such minimal dimension is not provided and may be quite hard, this new result completes the paper in a satisfactory manner.

A few minor comments and typos:

1. statement of Th. 13: "is hosting m pairwise..." should be 2^m

2. p. 8, line 1 in Sec. 3.1: I am not sure that "disclaimer" is the proper word here...

3. Theorem 15: in the paper [16] it is also proved that the vertices of a hypercube are the _only_ set of points with the given poperty

4. There is some confusion in Definition 22. First, Q is assumed a to be subgraph of a hypergraph, that means itself a hypergraph, which is a pair consisting of a set of nodes and a collection of hyperedges. So writing a \in Q, one should specify if it is a node or a hyperedge, to be precise. And then, what exactly is Q'? A subgraph (what are the edges?) or a subset of nodes? A subset of nodes would make more sense, but then

one should write q_l \subset Q'. Also, the quantifiers in the last sentence of Def. 22 seem in wrong order, it looks like all the q_l's should be the same. Would it not be easier just to write that all q_l\in \Theta? Or that the subgraph generated by Q' is complete? This should be better formulated.
(By the way, what is the role of the indices j and l in theta^j and q_l? They do not seem necessary)

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