Activity: Investigation

Today we spent some time in discussing what to do with our investigation. The purpose of the investigation to learn the state-of-the-art quantum technologies. Per discussion, we talked about couple companies (Intel, IBM Q, Station Q, Google Quantum AI Lab, D-Wave, Alibaba, etc) already and provided the links (please check the material provided on blackboard for this course) to their research websites. What is the next step? Well, it is all depending on what you WANT to do with your investigation. So, it would make sense to write out a 1-2 page proposal and give a 5 minutes presentation (per team) next Thu (09/21) on the your investigation initiatives. The proposal should contain the following components:

Purpose What is it exactly that you want to learn from this investigation activity? It is not like, oh, I have to do this to get a grade, it is more like among so many quantum technologies, which one interests you the most and you want to dive in to check. But what is it that you would like to check? Or you want to understand the basic quantum systems out there and you would like that to become your expertise such that, let say if this tech thrives, you can design protocols that can be applied in the NEAR future.

Investigation Your investigation would be coherent to your purpose. It could be theory, it could be hardware, and it could be software (eg. IBM Q has software). Let suppose you have your mind set up on investigating the quantum system such that in the future you can design quantum communication protocol. So, to investigate, you might need to do (a) dig into the system of interest looking into the qubit candidates they use (b) check current existing protocol designed for such a qubits (c) understand the bottleneck for such a qubit system and talk about it (d) come up some suggestion of your own (based on theory and current experiment), for instance, will you be able to come up a new protocol (always much easier than algorithm and more applicable)? will you be able to see some insight that maybe the inherent bottleneck is hard to break through, any hybrid way to handle this or interesting structure you have in mind can help (for instance, the flip flop)?

Methods How do you quantify your investigation/finding?

Once you have thought about these all over, write up the proposal and give a 5 minute presentation.