Project 1 Team 15

# The technical problem

The problem tackled in this exercise is to find the maximum independent set (MIS) that allows the best coverage of an area with the minimum number of emitters. In our case, the sites for the antennas are in fixed positions with a specific coverage radius.

# The business problem and its solution

Antenna placement strategies for the new 5G mobile network are one of the main issues in the telecommunication industry. To completely exploit the potential of 5G technology, the new generation of antennas require Line of Sight (LoS) arrangements. LoS leads to the necessity of a large number of antennas and, consequently, a huge cost to build the new infrastructure. Minimizing the costs while obtaining good coverage for the final user is a complex task that conventional computers struggle to solve efficiently. This problem can be mapped in an MIS exercise and ran on a neutral atom quantum computer to find the best option for the placing of the antennas.

# Who pays for the solution?

The telecommunication infrastructures are expensive in terms of construction cost and maintenance. Even some fewer antennas could give huge savings in the long run. So the owners of the infrastructure are the ideal customers for a company that sells solutions for the optimization of the placements of antennas and 5G hardware.

Huawei, for example, spent more than 2 B$ in the last few years to develop and deploy the new 5G network. Nowadays, we are only at the beginning of the 5G era.

A short list of potential customers are:

* Huawei
* Ericsson
* ZTE
* Cisco System
* Qualcomm
* Samsung
* Nokia

### Recording:

https://drive.google.com/file/d/1RlJtkURdWmYn9dCwmz\_xSxqJq5kpSSv2/view?usp=sharing

### Link to one slide:

https://docs.google.com/presentation/d/1wgn4rCATvDR\_YQrLRNWAgnaHUa6OGgZr/edit?usp=sharing&ouid=111882103117032658831&rtpof=true&sd=true