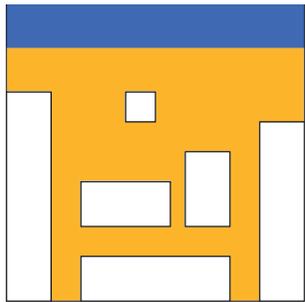


Use Case for PolyChord Optimisation:

Optimising Sensors in a Network

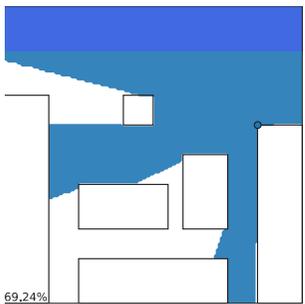


 =Buildings
 =Coverage area

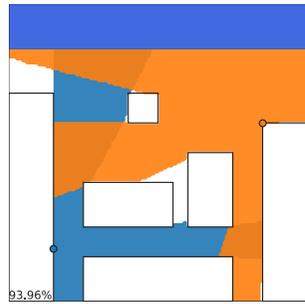
*The placement of sensors in a network is a complex, multi-parameter data science problem. PolyChord is currently being contracted by the Ministry of Defence in the UK to use our unique technology in a project which optimises the placement of sensors in a Network. This has key applications in the commercial world, including in 5G as constraints represented by buildings and other obstructions are taken into account. Optimising the placement of sensors using PolyChord **reduces cost** through less use of expensive hardware, **increases the reliability** of coverage and **lowers your carbon footprint**.*

Here is a typical example demonstrating PolyChord's current work optimising the placement of sensors for the Ministry of Defence. PolyChord's **high dimensional** capabilities mean these techniques in reality optimise coverage for a whole city, state or country. PolyChord handles **complex constraints** such as "only place sensors on roofs" or "building is out of bounds" for sensor placement. Rather than keeping devices static in the planning phase, PolyChord resamples over the data space as new devices are added, allowing it to optimise over all possible positions of all devices efficiently to generate the best possible solution.

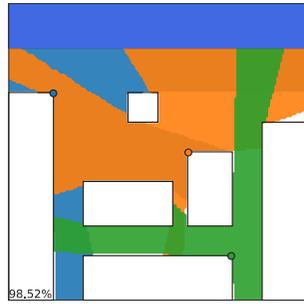
Optimised with PolyChord



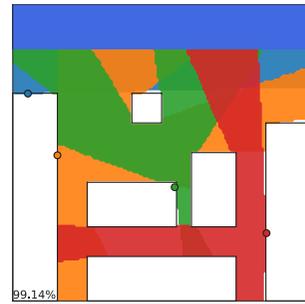
One sensor - position chosen by PolyChord.



Two Sensors - position chosen by PolyChord.

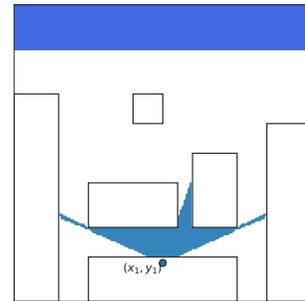


Three Sensors - position chosen by PolyChord.

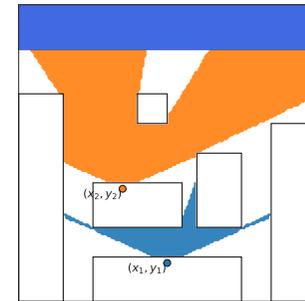


Four Sensors. You can set an improvement limit as PolyChord shows clearly little difference between 3 and 4.

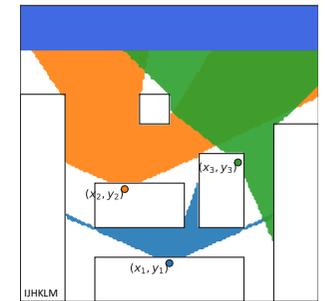
"Best guess" without PolyChord



One sensor, large area without coverage.



Two sensors, slightly better,



Three Sensors, some improvement. This can be optimised through brute force - but is computationally very expensive.

This project has been developed over three phases with the Britain's M.O.D over a 12 month period (2020-2021) on a fee-paying basis. intellectual Property belongs to PolyChord Ltd and we now have interest in applying our technology to consumer networks with B.T and Telefonica.