Optimal Placement of Pillars in an Underground Stoping Mine

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Underground stoping mines need pillars for their stability

Some areas are mined, while others are left in place to provide this stability

All areas have a value

The problem is that of determining which areas to leave in situ and which to extract to:
  - minimize sterilized ore
  - while ensuring structural stability of the mine

So far, this is a very difficult problem because of the dependence between pillars!
Creation of Block Model
Pillar Influence: Many Areas

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Optimal Pillar Placement
Pillar Influence: Two Configurations Must Hold

Cross Configuration

Plus Configuration

If the combination yields an accepted extraction ratio

Accepted Combination
Pillar Influence: Using Midpoints as Approximations

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Optimal Pillar Placement