Desired Path-Dependent Enemy Placement in Stealth Video Games

COMP 400 Research Project

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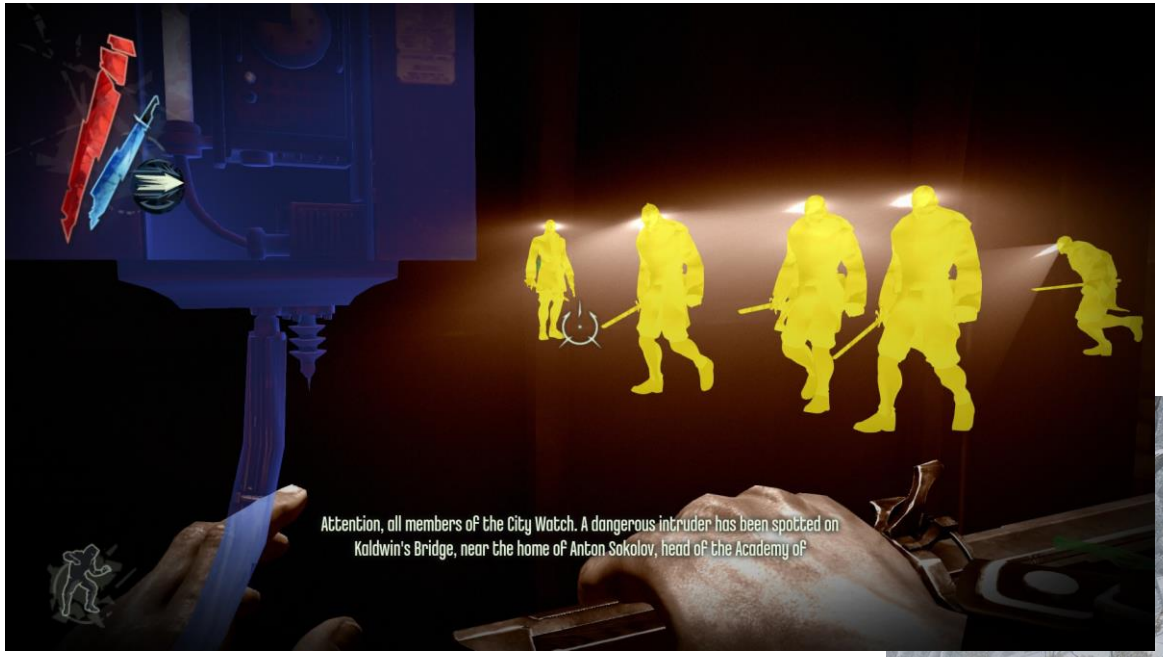
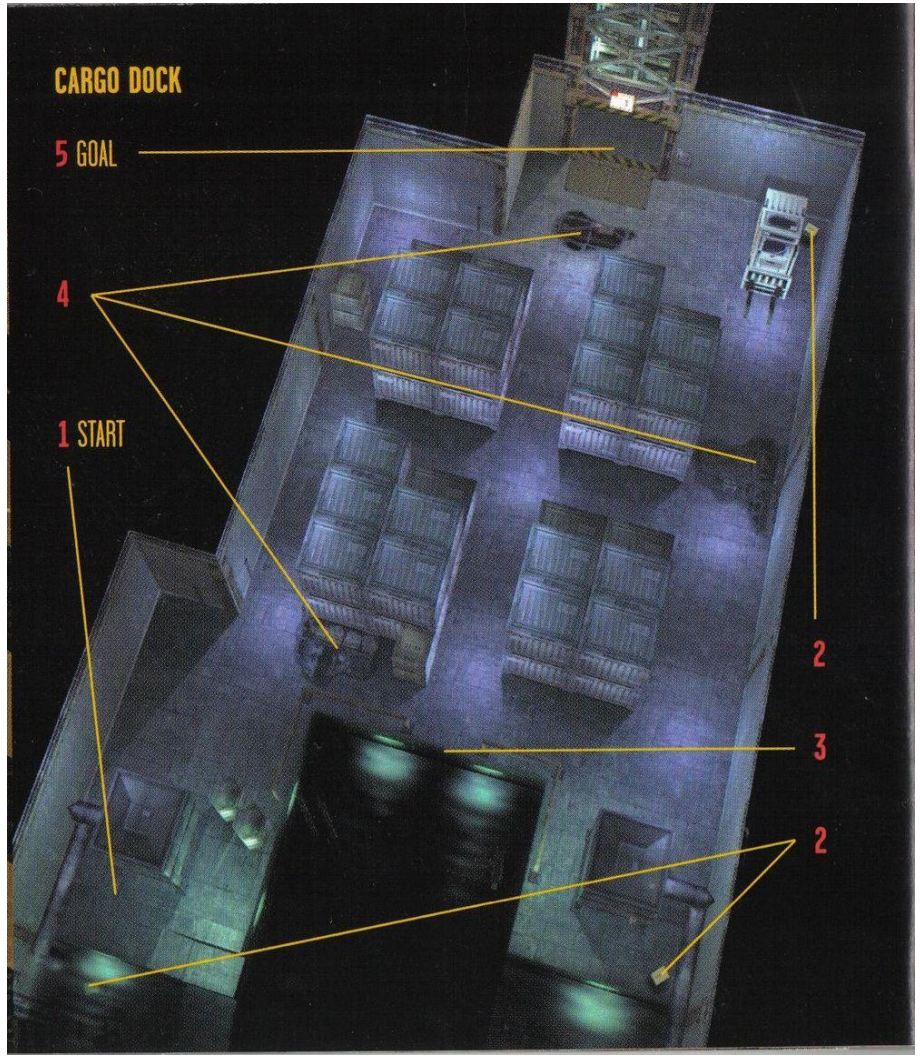
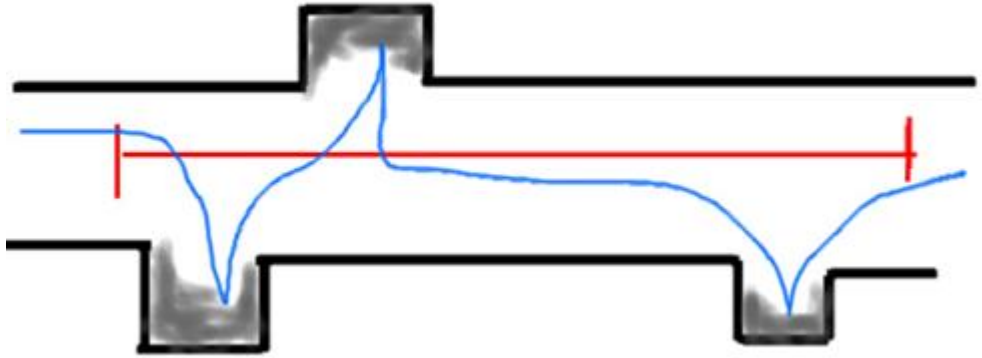
Introduction & Background

Stealth Video Games

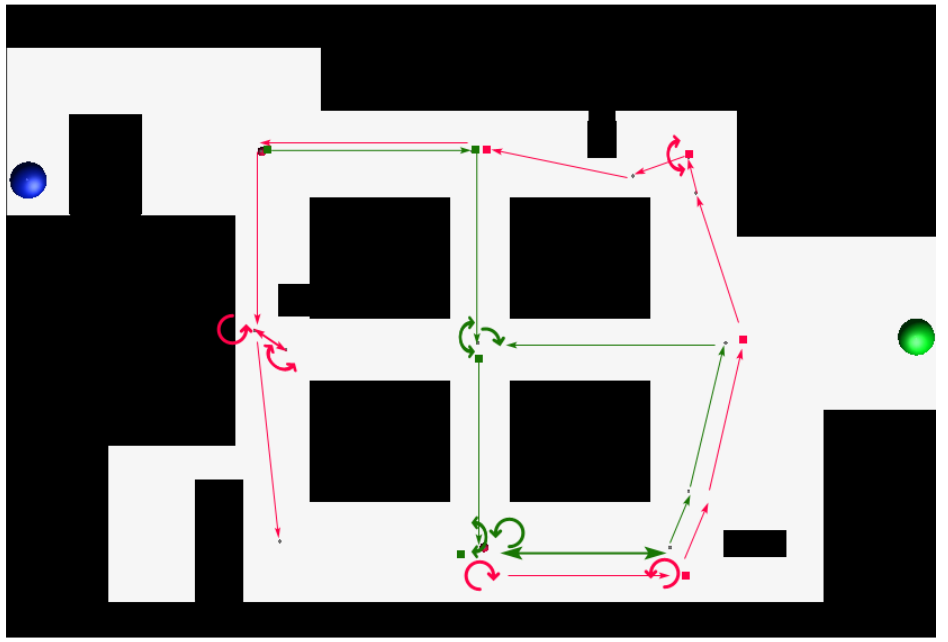


Two-dimensional Models





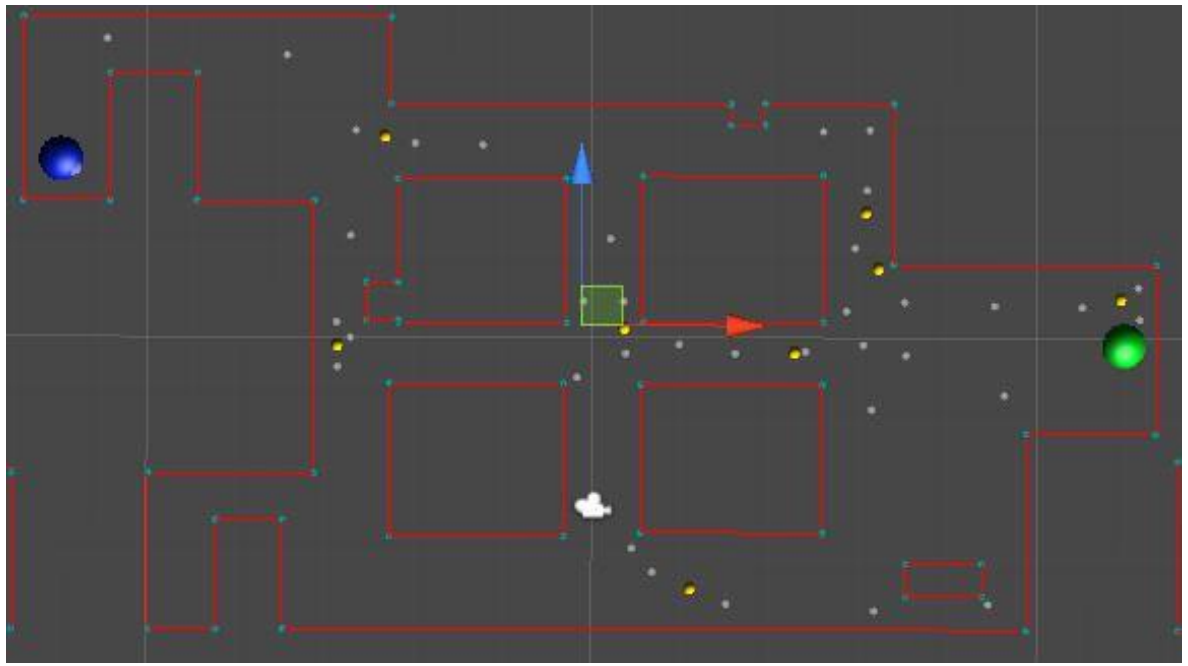
Procedural Content Generation



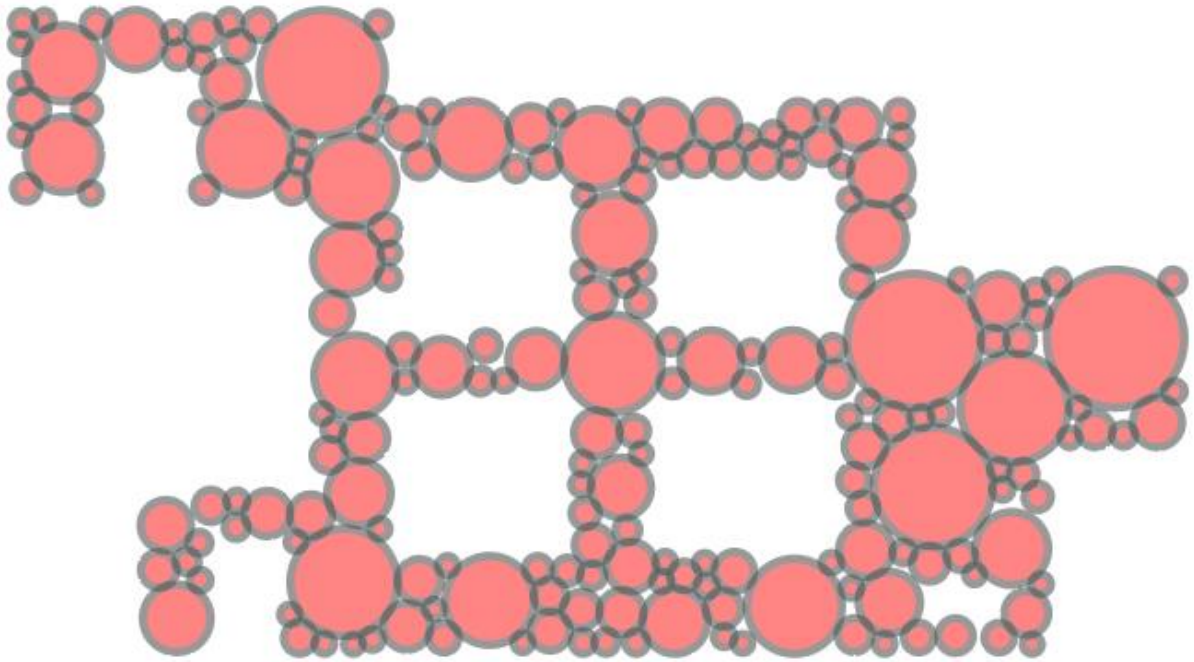
Developped Algorithm

Geometry Extraction

- Take a 2D Unity level
- Discover the walls
- Export as “holed” polygon



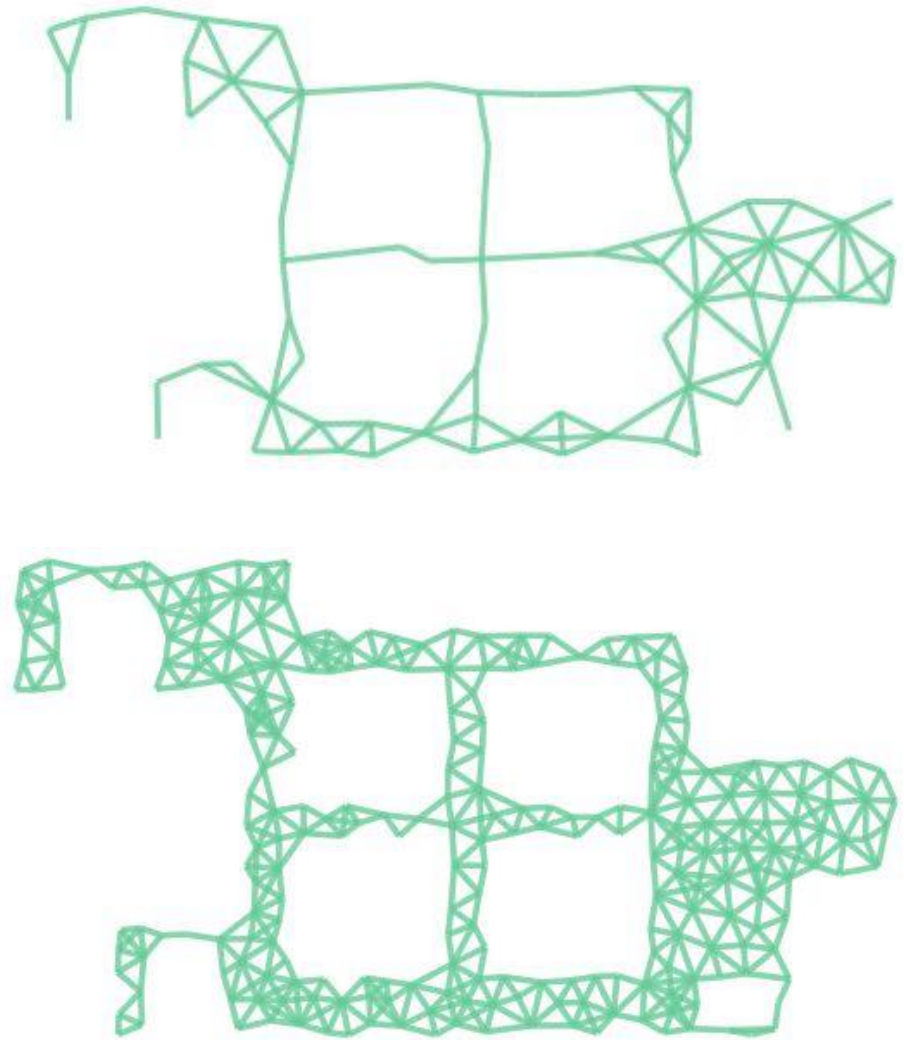
Random Circle Packing



- Extend (dilate) the current level polygon
- Choose a random point on boundary
- Remove the new circle from the polygon
- Repeat until cannot proceed

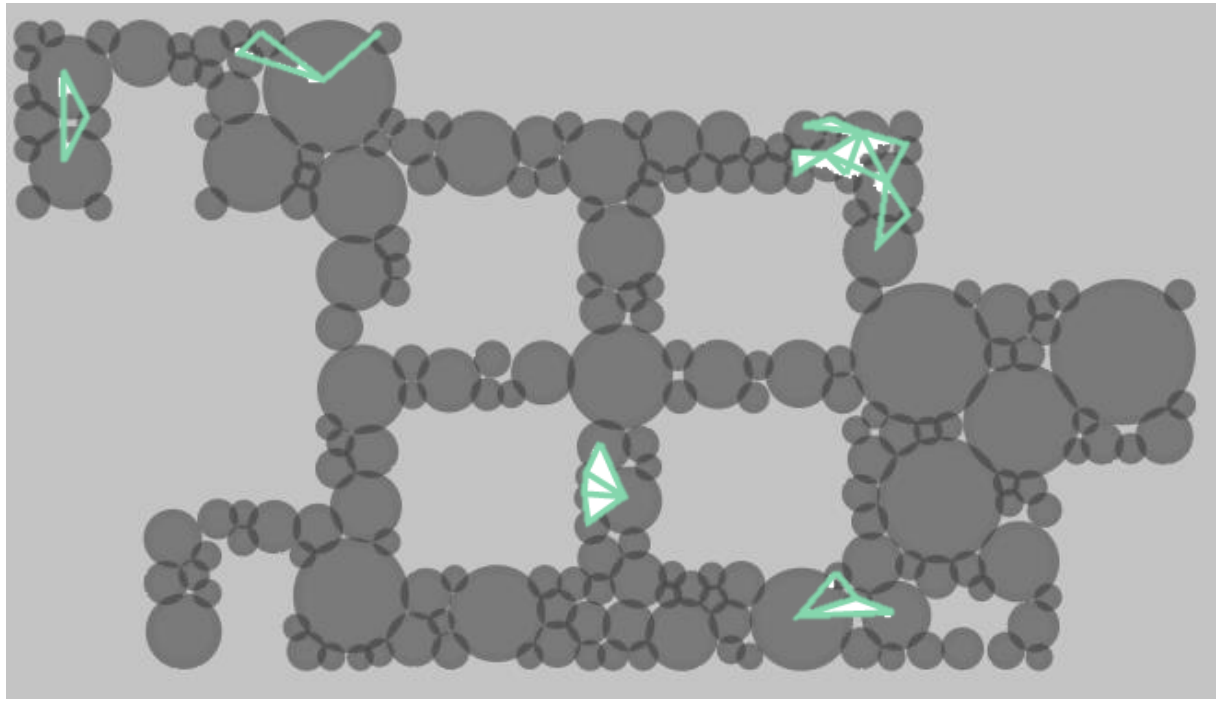
Pseudo-Intersection Graph

- Choose a pair of circles
- Draw a segment between the centers
- Is it valid?
- Export resulting geometry



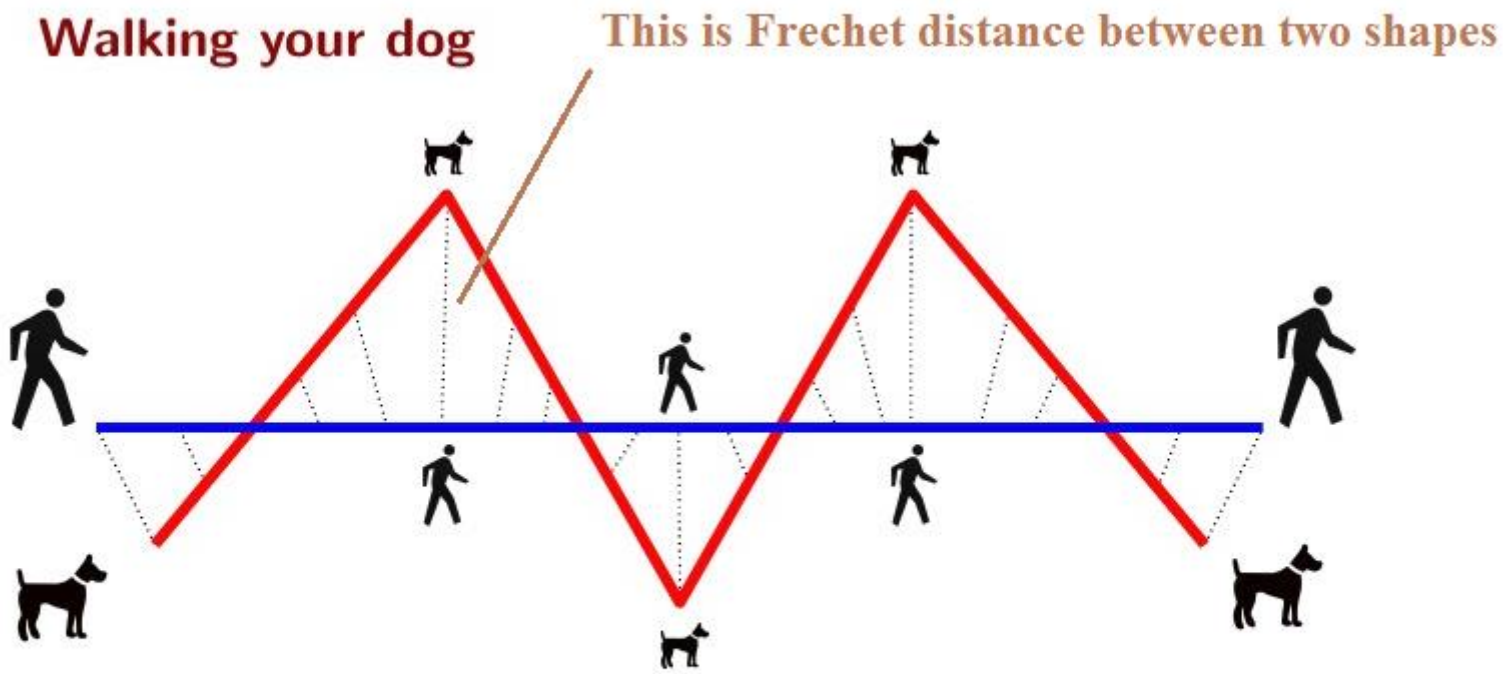
Enemy Generation

- Generate the weighted graph
- Generate random walks
- Add to weights to avoid clusters
- Import to Unity



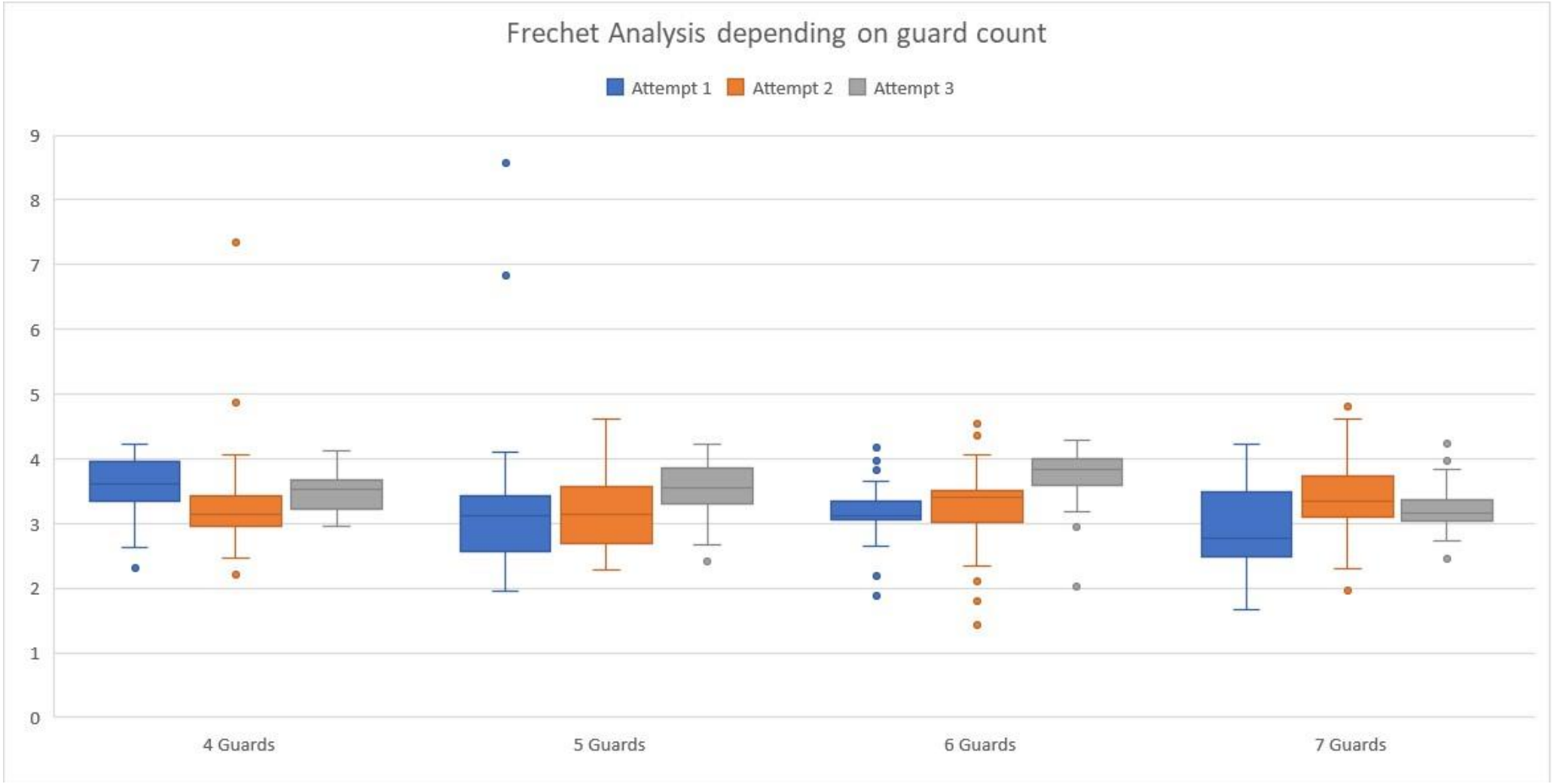
Results and Analysis

Measured Metric : Fréchet Distance

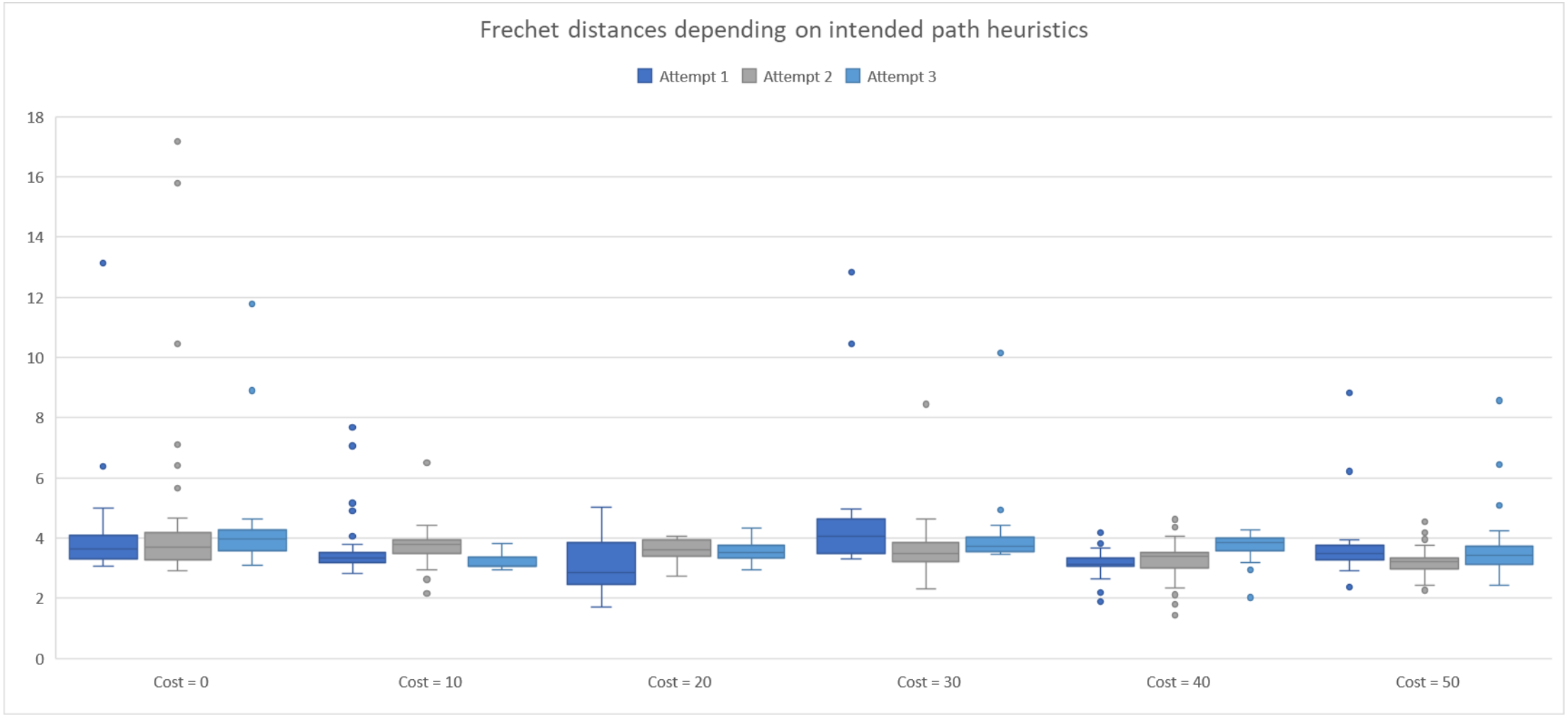


The **Fréchet distance** between the curves is the minimum leash length that permits such a walk

Testing Guard Numbers



Testing Path Costs



Conclusion & Questions