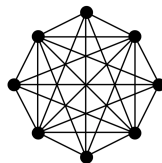


Search by quantum walks

- N elements distributed in space (e.g., a physical database)
- Model: N -vertex graph G
- Dynamics of the quantum walk on the graph is determined by the Laplacian L of the graph

$$H = -\gamma L$$



Adjacency matrix:

$$A_{ij} = \begin{cases} 1 & \text{if } (i, j) \in G \\ 0 & \text{otherwise} \end{cases}$$

Diagonal degree matrix:

$$D_{jj} = \deg(j)$$

Laplacian matrix:

$$L = A - D$$