

# Nearest neighbor search in high dimensional spaces

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- Why do we need to optimize KNN?
- Complexity analysis
- Data structures
- Difficulties in high dimensional spaces
- Approximate NN search: Locality Sensitive Hashing
- Approximate NN search: FlyHash
- Approximate NN search: Hierarchical Navigable Small World

# Why do we need to optimize KNN??

- Very large datasets
- Very frequent queries
- Duplicates search
- It seems that brute force algorithm doesn't use information gained from calculating previous distances: if  $d(a, b)$  is big and  $d(a, c)$  is small does it mean that  $d(a, c)$  is big?