Finding the closest pair

Computational Geometry [csci 3250]
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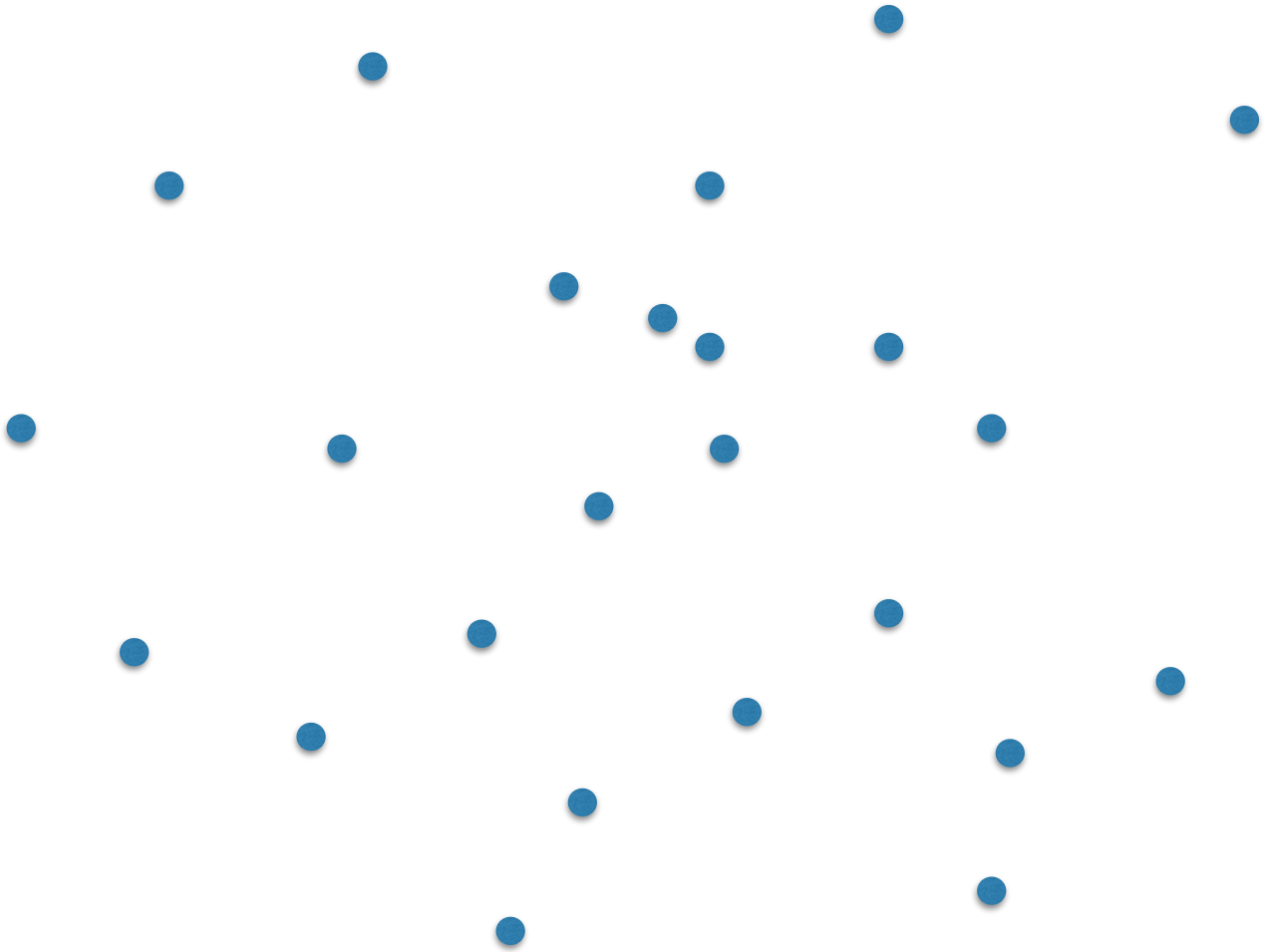
Given an array of points in 2D, find the closest pair.



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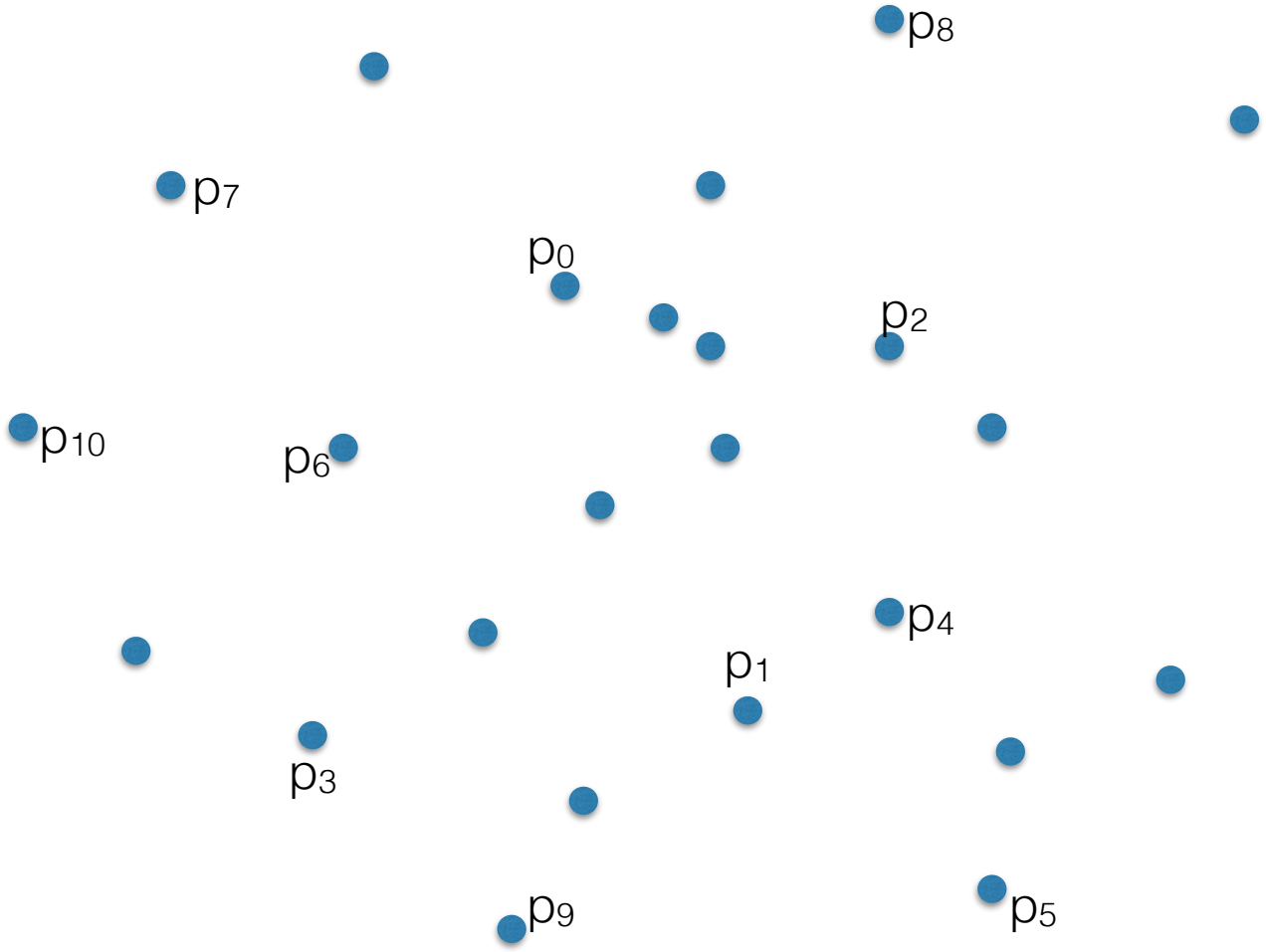

P

p_0	p_1	p_2	p_3	p_4	p_5	....

The distance between two points p and q is given by the Euclidian distance given by the formula:

$$d(p,q) = \sqrt{(x_p - x_q)^2 + (y_p - y_q)^2}$$

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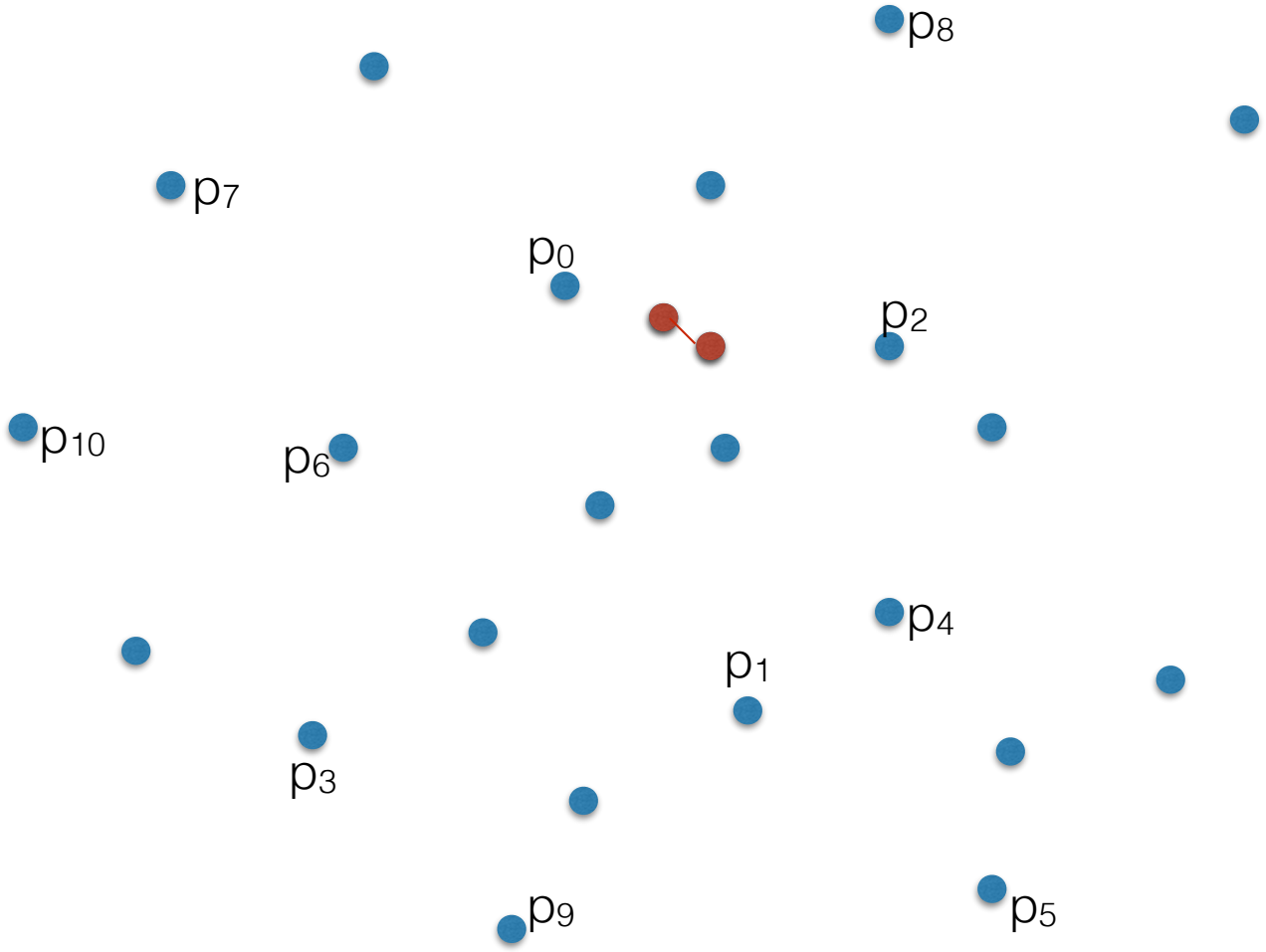

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Brute force:

- mindist = VERY_LARGE_VALUE
- for all distinct pairs of points p_i, p_j
  - d = distance (p_i, p_j)
  - if (d < mindist): mindist=d

- Analysis:
  - $O(n^2)$ pairs ==> $O(n^2)$ time