

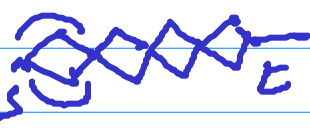
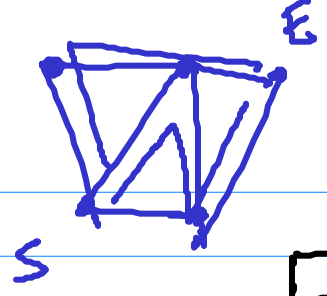
CSL 852 Computational Geometry

Lecture 1

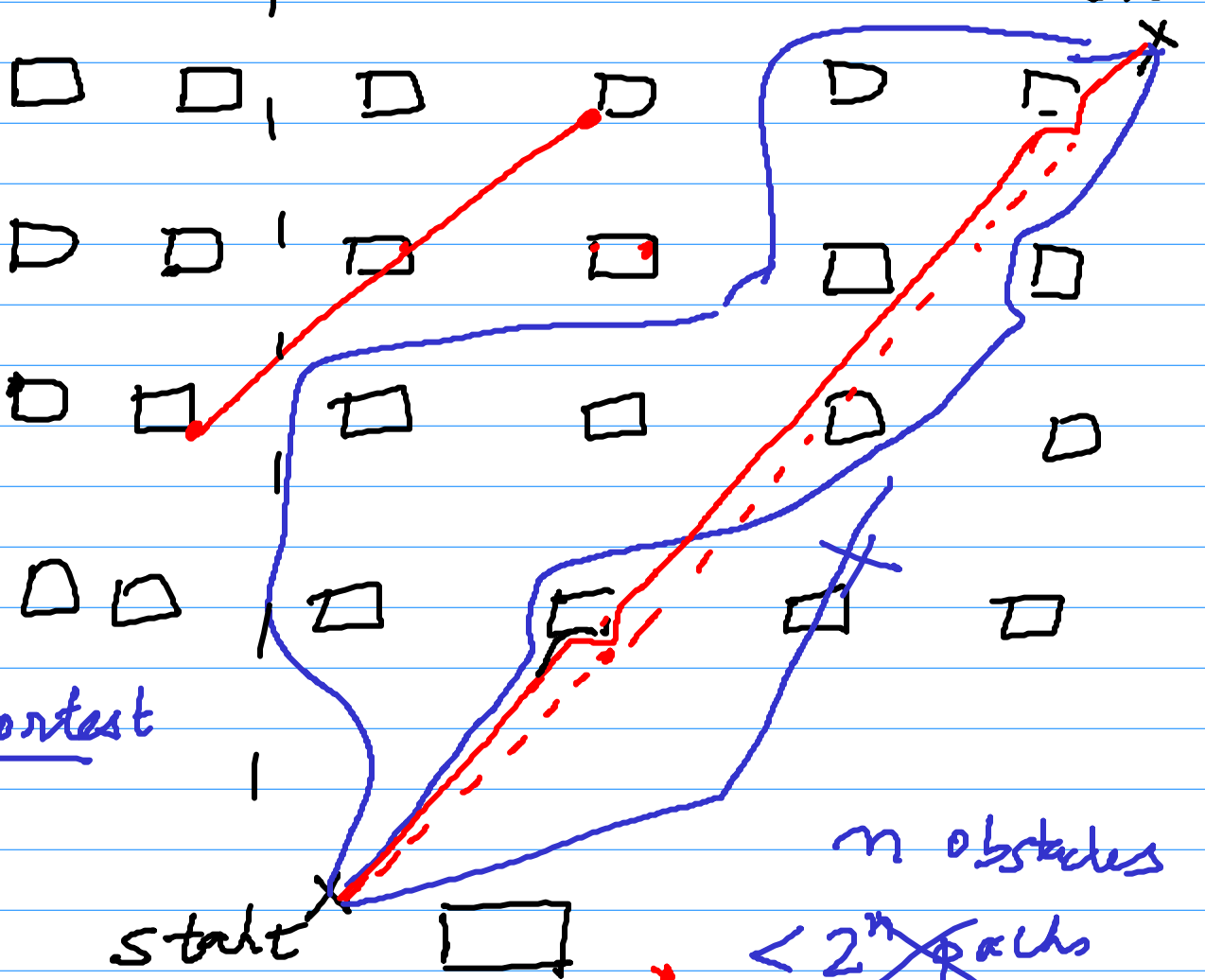
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mid-term	+	major	Assignment
25		40	problems
			20
			prog.
			15 = 10
T W F		5-6	

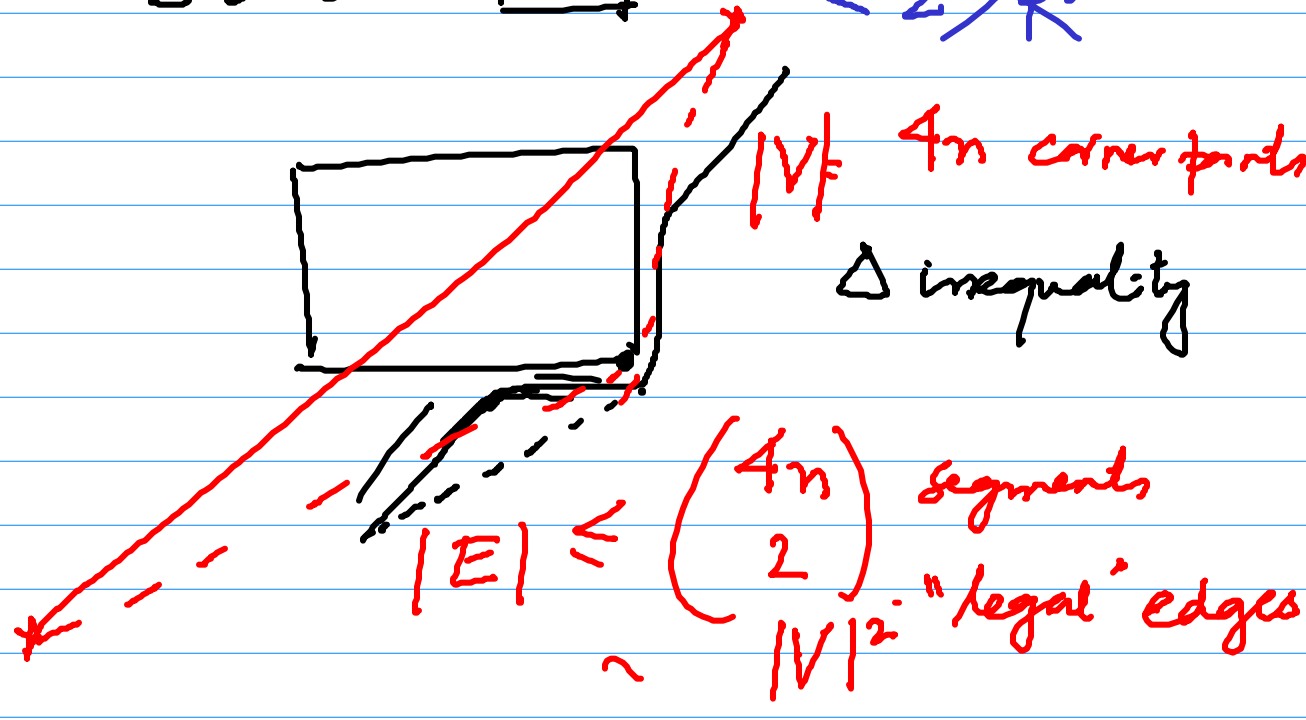
Navigating in a geometric environ



Find Shortest path



n obstacles
 $< 2^n$ paths



$|V|$ $4n$ corner points
 Δ inequality

$|E| \leq \binom{4n}{2}$ segments
 $\sim |V|^2$ "legal" edges

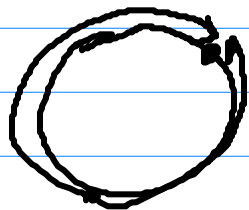
Graph with $4n$ vertices

$n = \# \text{ obstacles}$

edges is $O(n^2)$

weights on edges : Euclidean distance between the end points v_1, v_2

v_i : defined by a coordinate pair
distance between (x_{v_1}, y_{v_1}) and (x_{v_2}, y_{v_2})



geodesic shortest

Can there be a faster algorithm?

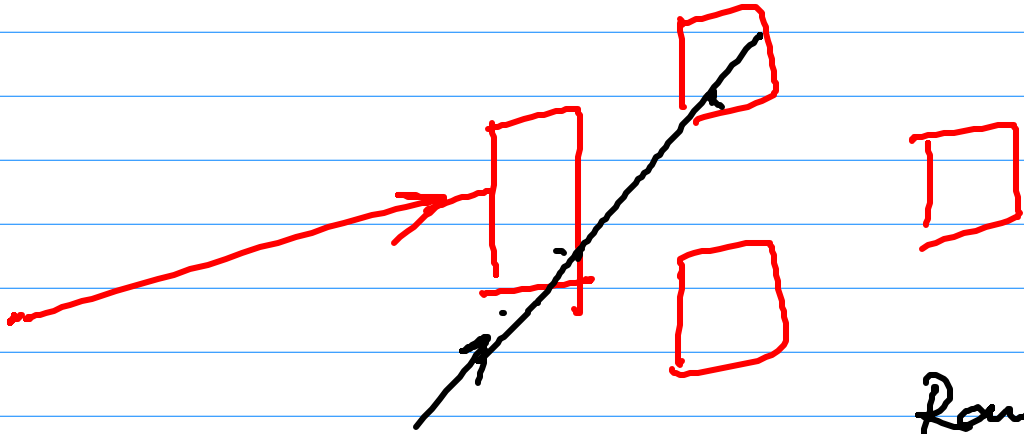
$$\Omega(|V| + |E|)$$

Find a Minimal Spanning Tree of a given set of points.



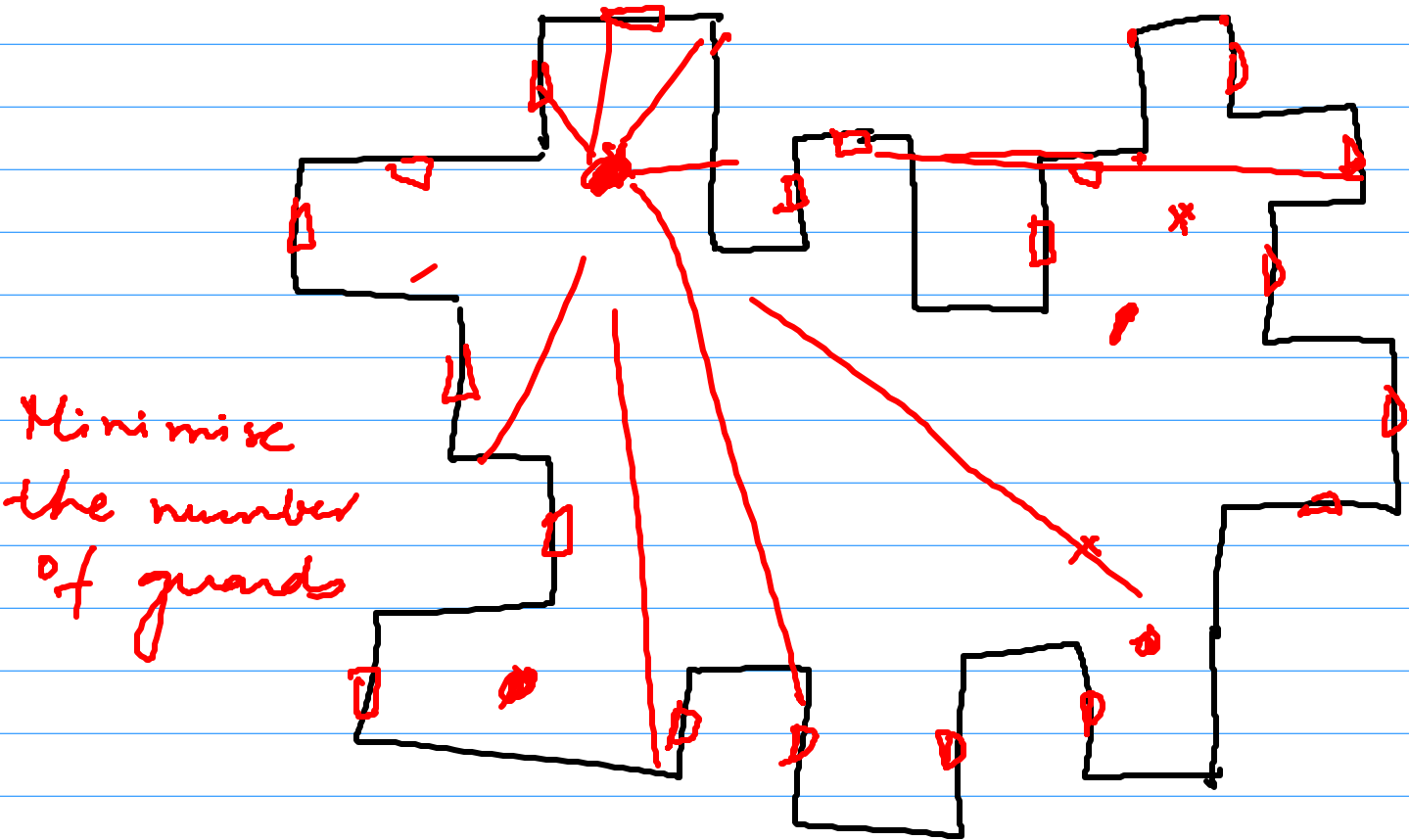
$3n$

Visibility Problem



Art-Gallery Problem

Ray shooting



Minimise the number of guards