

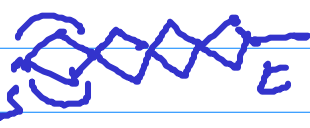
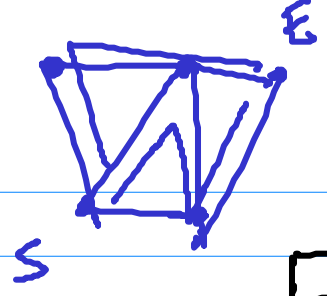
# CSL 852 Computational Geometry

## Lecture 1

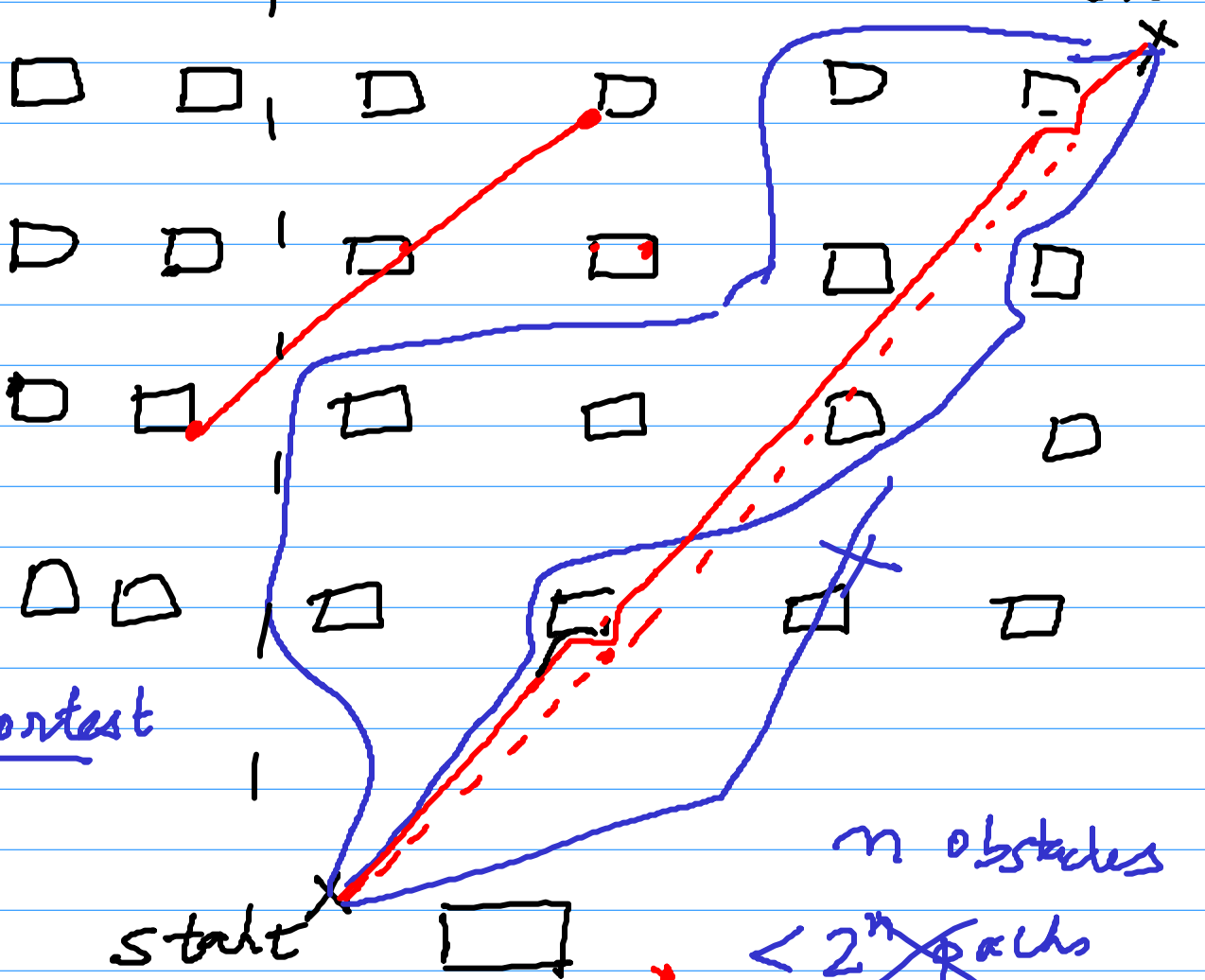
[www.cse.iitd.ernet.in/~cs852](http://www.cse.iitd.ernet.in/~cs852)

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

# Navigating in a geometric environ



Find Shortest path



$n$  obstacles  
 $< 2^n$  paths



$|V|$   $4n$  corner points  
 $\Delta$  inequality

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

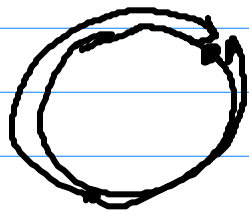
Graph with  $4n$  vertices

$n = \# \text{ obstacles}$

# 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.



$3n$

