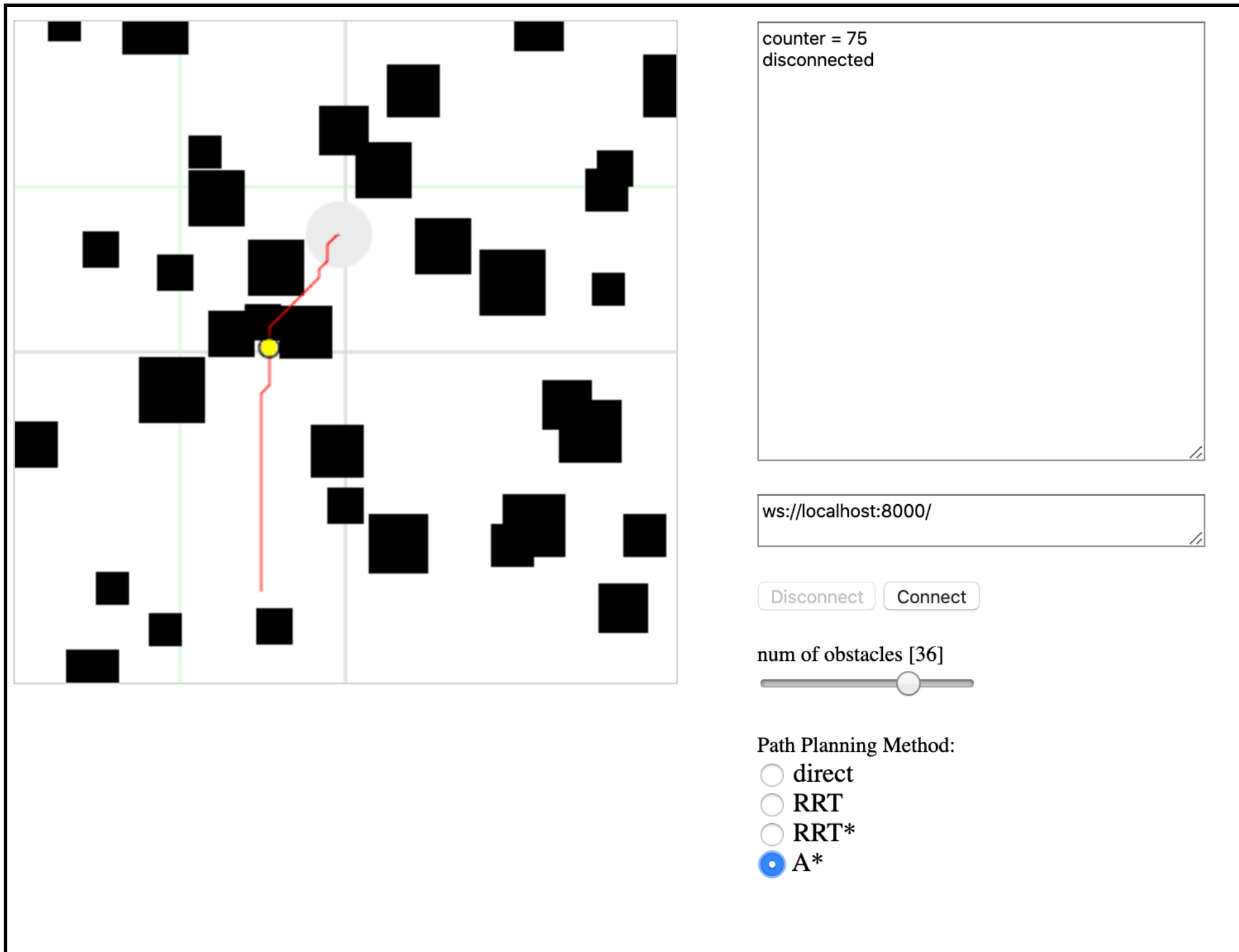


2D Path Planning

bachelor's project
Qazvin Azad University
Dr. Abbasi

Project by
Zahra Noury
winter - 2020

2D Path Planning



The interface displays a 2D environment with black square obstacles. A yellow circle represents the start point, and a grey circle represents the goal point. A red line indicates the planned path from the start to the goal, navigating around the obstacles. The interface includes a status box, a WebSocket address input, connection buttons, an obstacle count slider, and a path planning method selector.

counter = 75
disconnected

ws://localhost:8000/

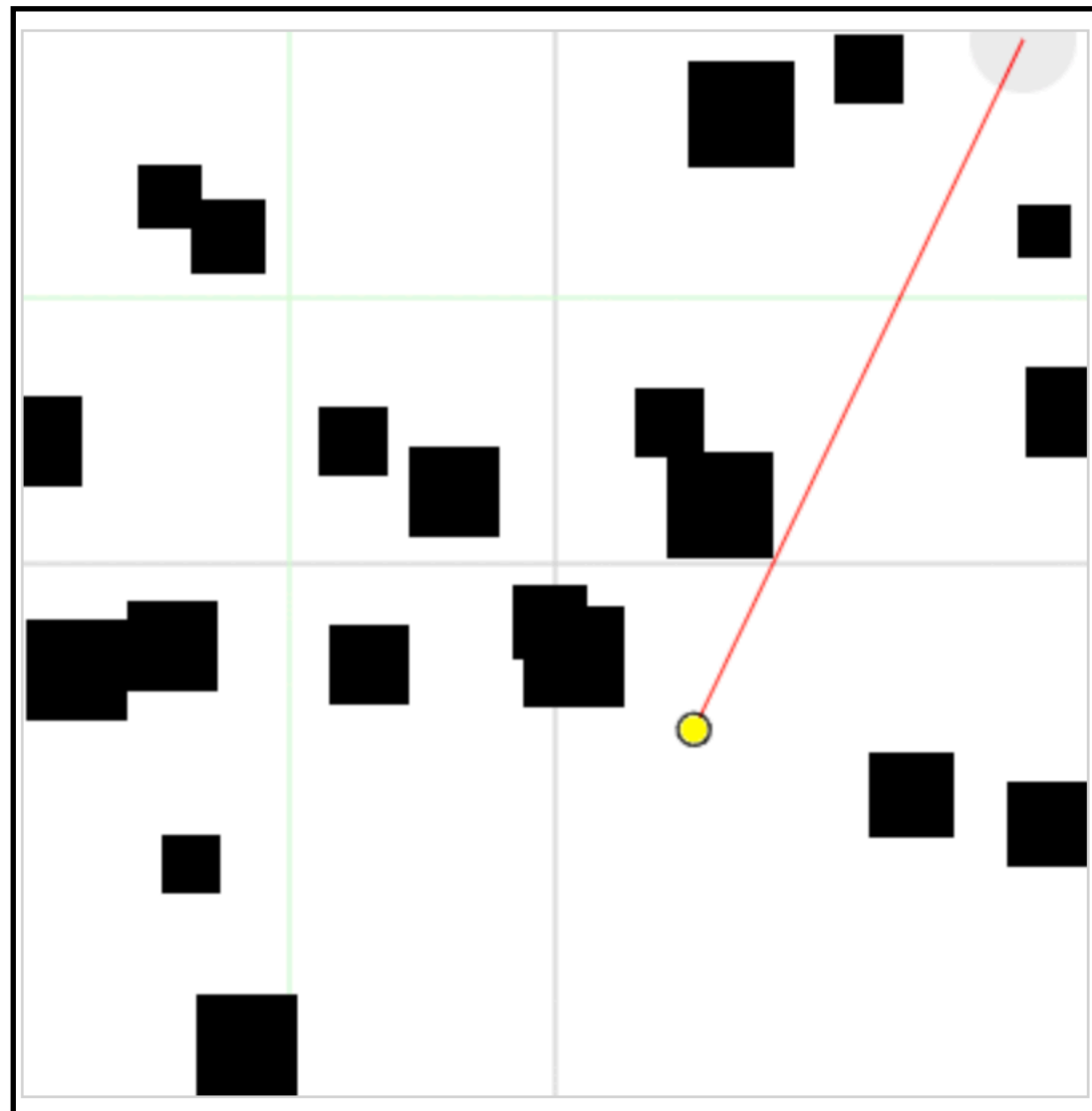
Disconnect Connect

num of obstacles [36]

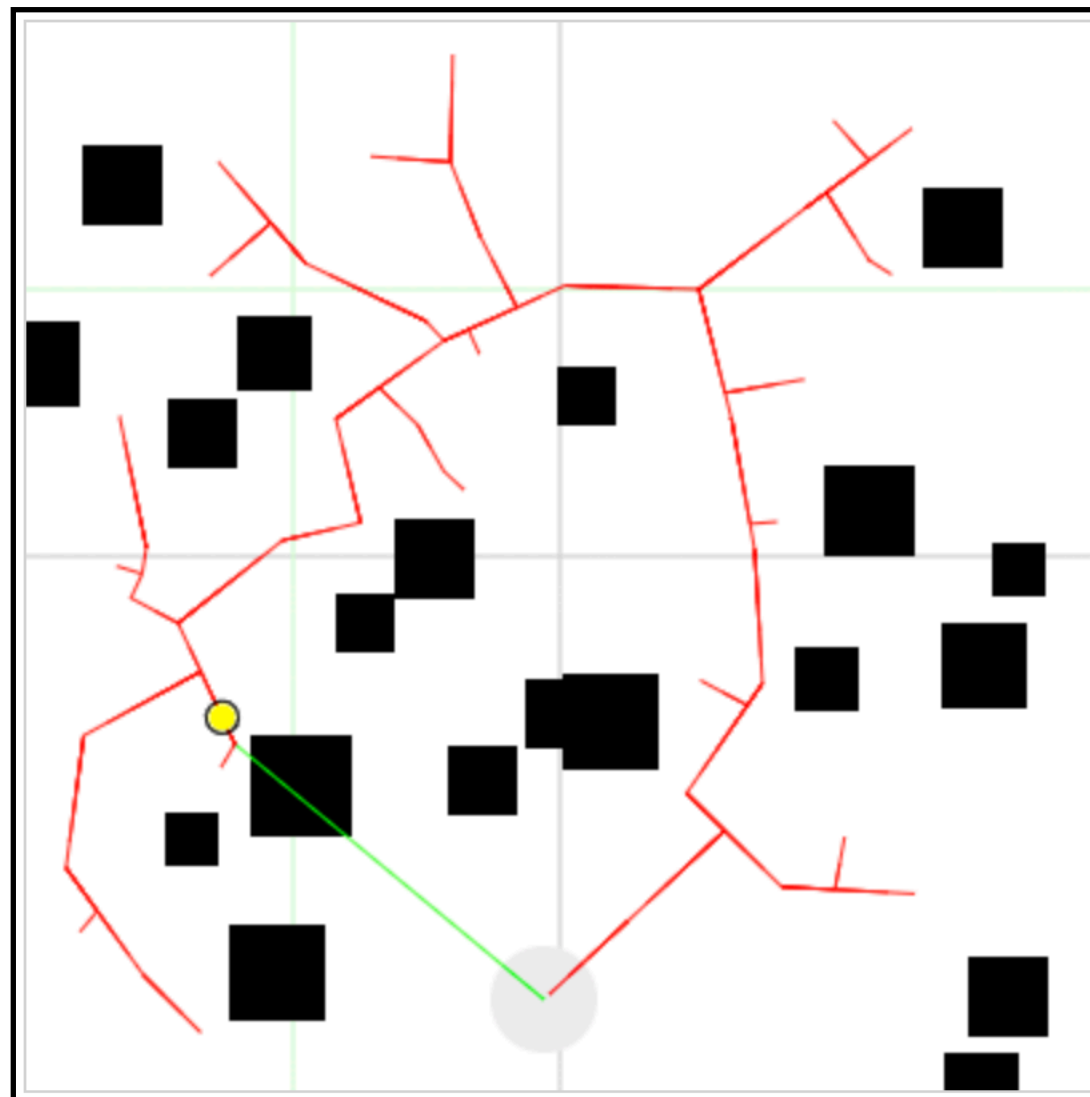
Path Planning Method:

- ☐ direct
- ☐ RRT
- ☐ RRT*
- ☒ A*

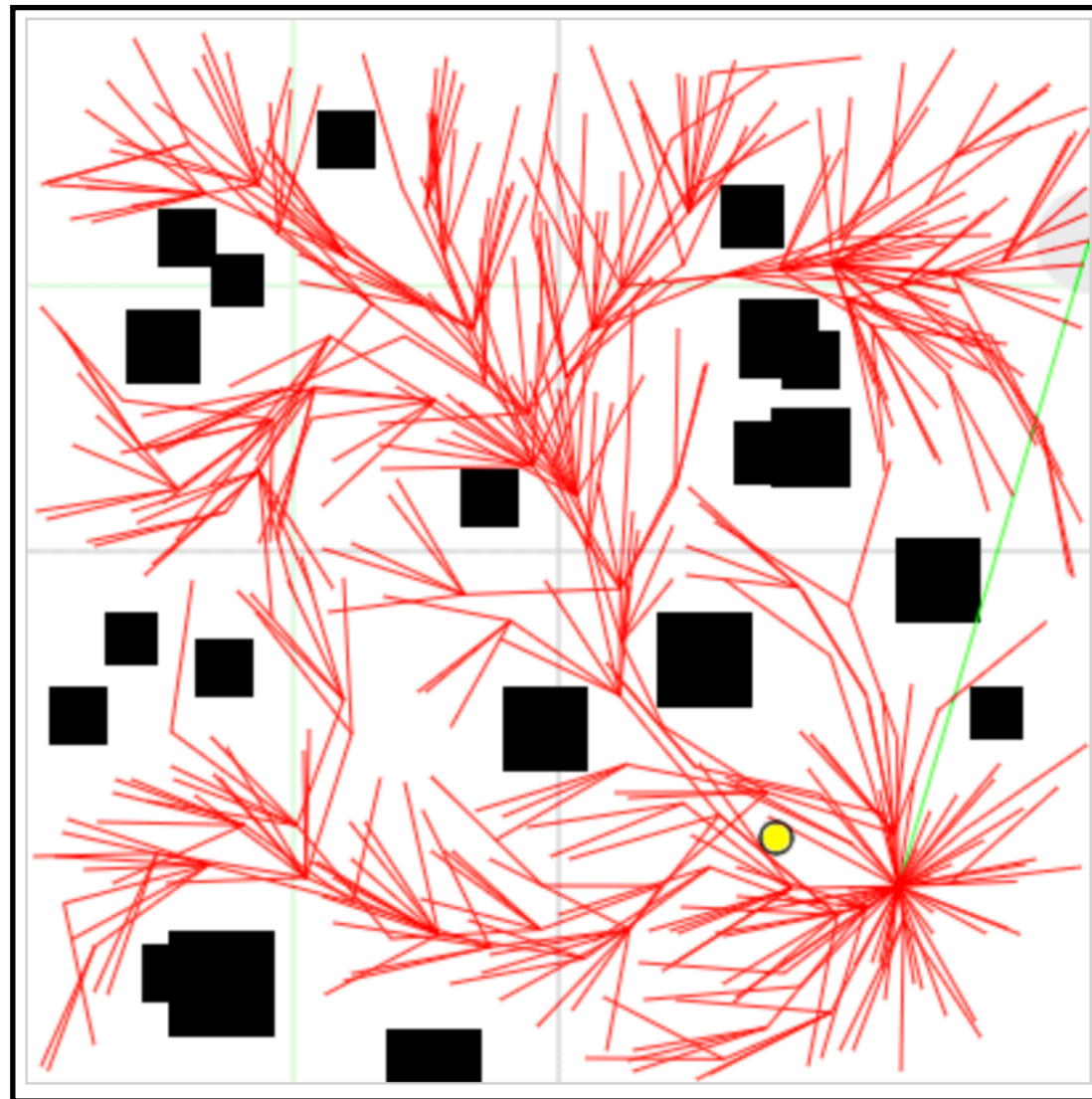
Direct



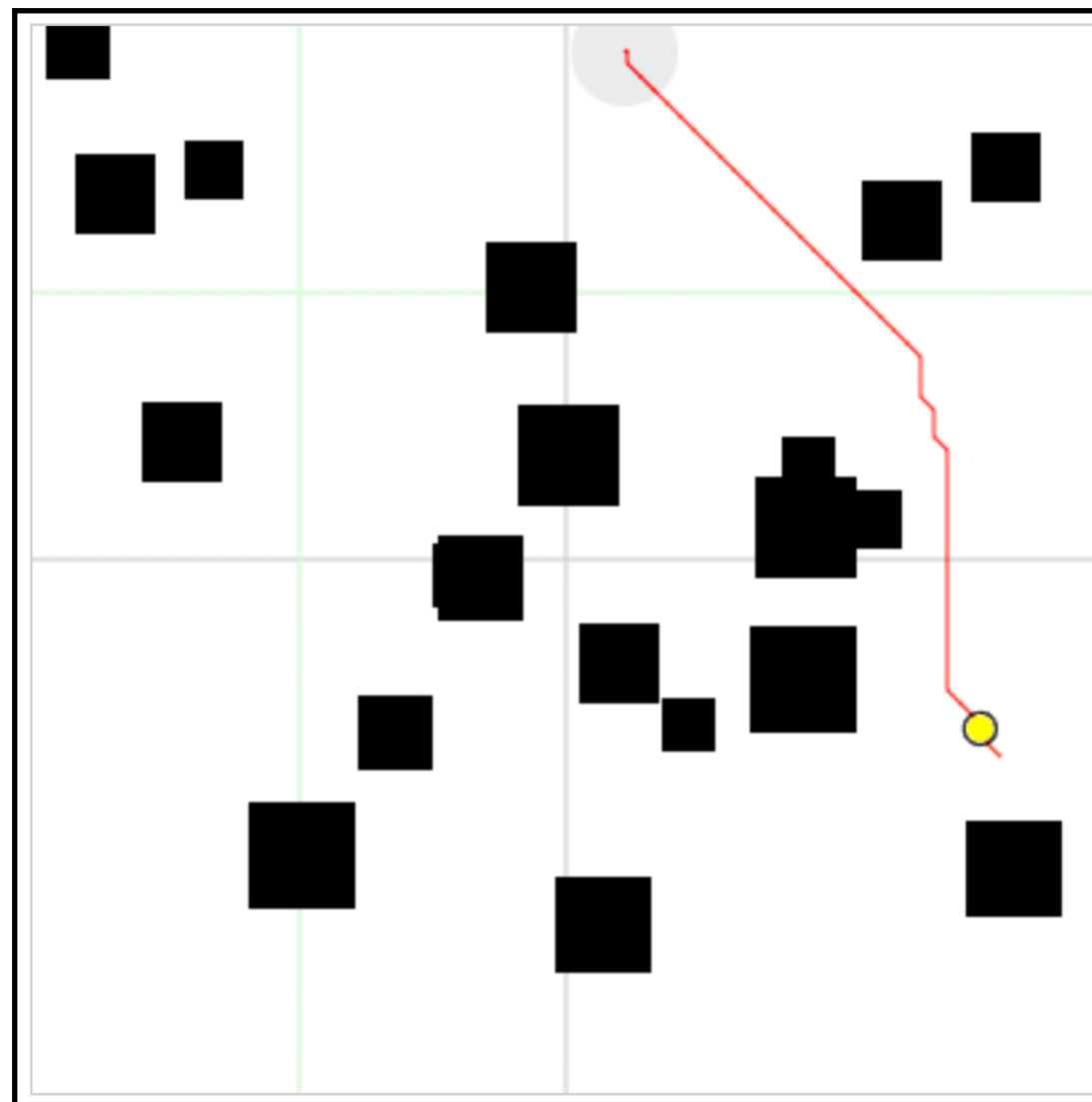
RRT



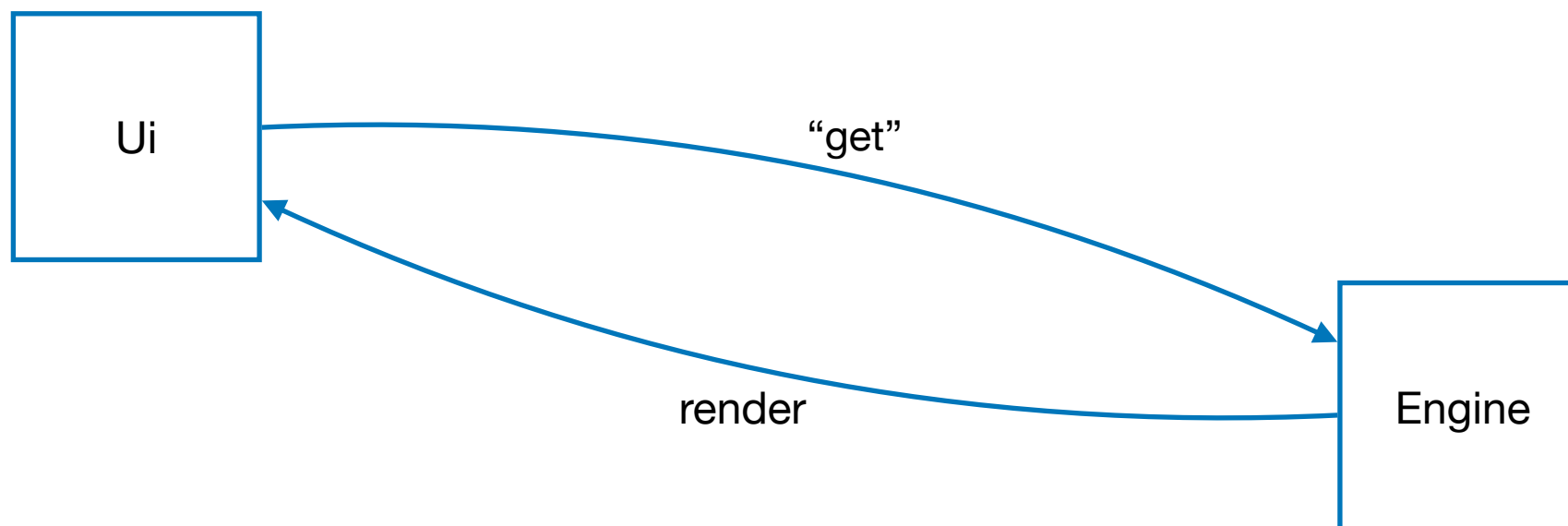
RRT*



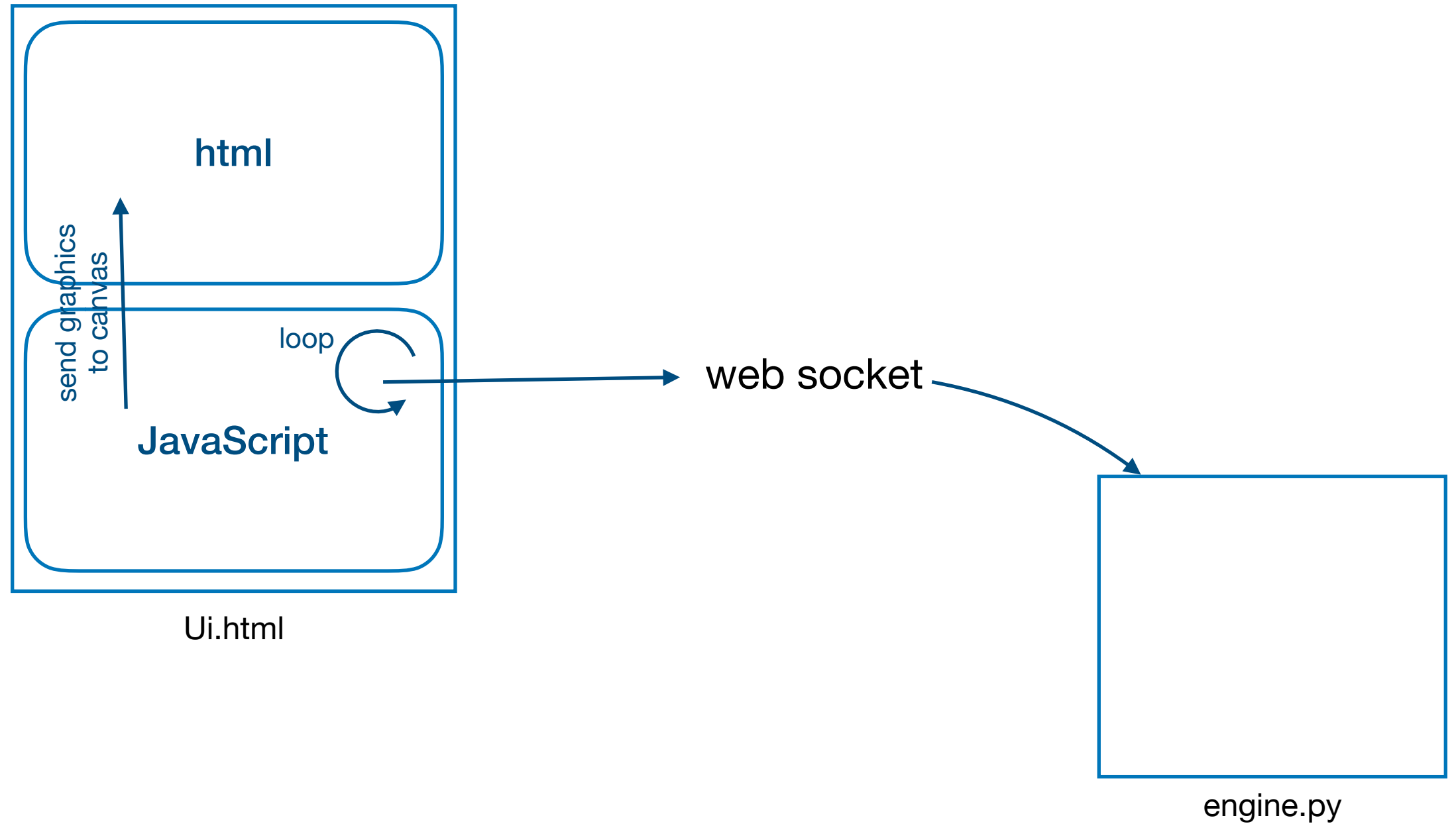
A*



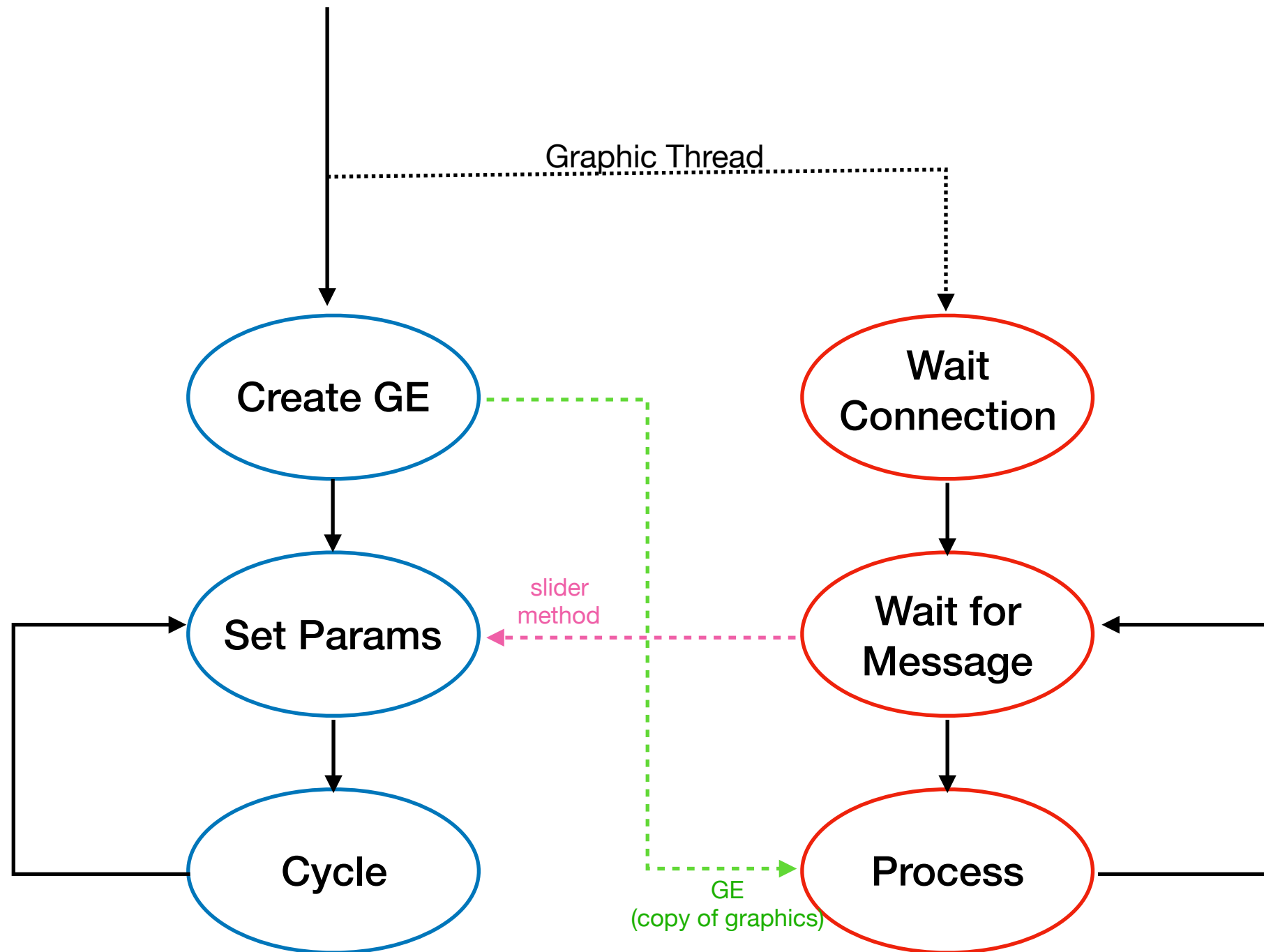
Overall Design



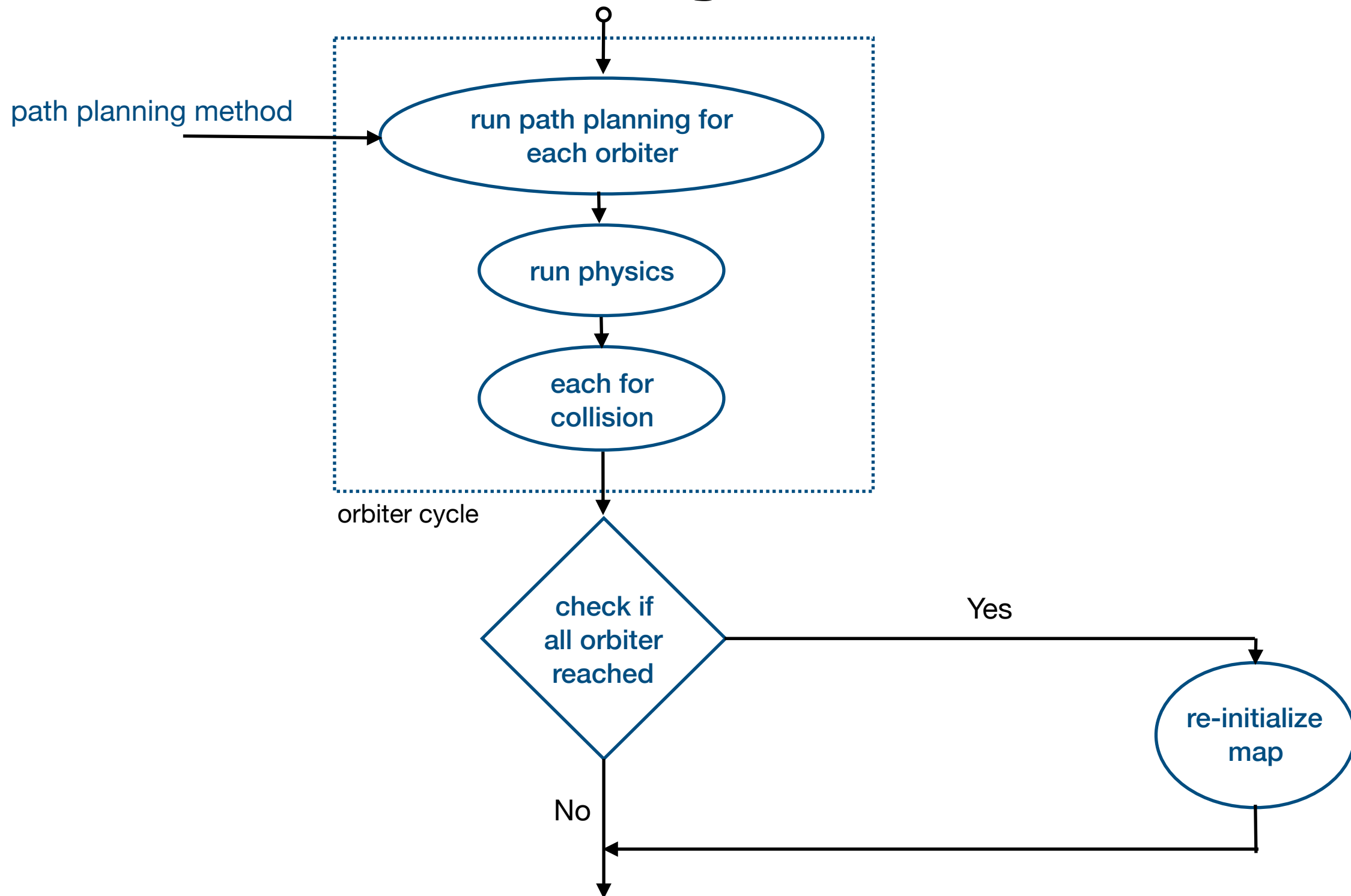
Ui



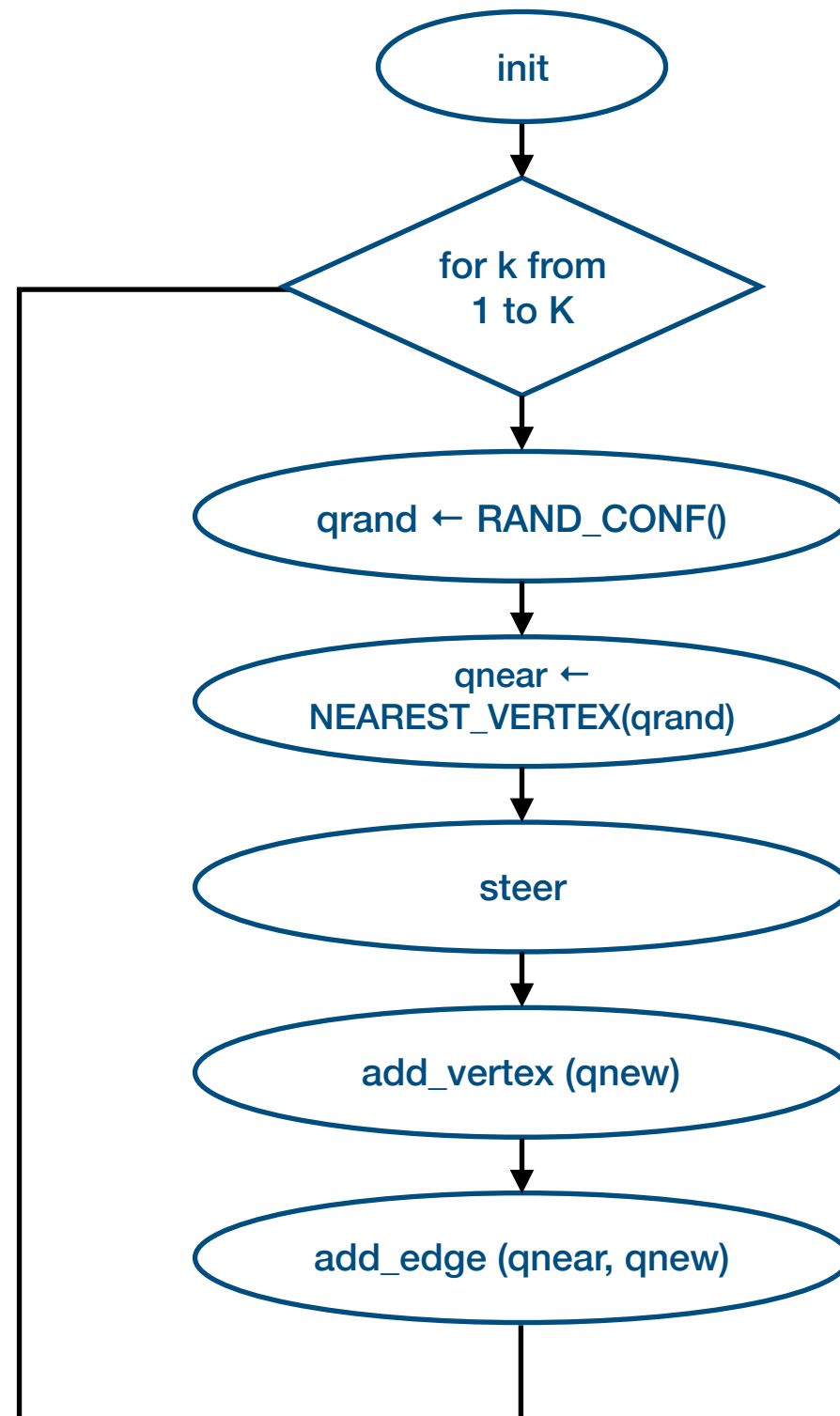
Engine



Cycle



RRT



A*

7	6	5	6	7	8	9	10	11		19	20	21	22
6	5	4	5	6	7	8	9	10		18	19	20	21
5	4	3	4	5	6	7	8	9		17	18	19	20
4	3	2	3	4	5	6	7	8		16	17	18	19
3	2	1	2	3	4	5	6	7		15	16	17	18
2	1	0	1	2	3	4	5	6		14	15	16	17
3	2	1	2	3	4	5	6	7		13	14	15	16
4	3	2	3	4	5	6	7	8		12	13	14	15
5	4	3	4	5	6	7	8	9	10	11	12	13	14
6	5	4	5	6	7	8	9	10	11	12	13	14	15

Results

Sample Size	10		20		30		40	
Method	average frame	success rate	average frame	success rate	average frame	success rate	average frame	success rate
Simple	48	58%	47	26%	29	30%	13	16%
RRT	123	100%	135	100%	149	100%	137	91%
RRT*	77	75%	62	76%	61	38%	55	45%
A*	77	41%	74	46%	47	25%	36	20%

- RTT: most accurate approach
- Simple: fastest approach