

# Lecture 9 ()

## 1 Iterative Deepening A\* (IDA\*)

Limit value of  $f$  and perform A\* iteratively increasing the value of  $f$ .

## 2 Weighted A\*

A\* but  $f'(n) = g(n) + w \times h(n)$ , this might lead to  $w \times h(n)$  not being admissible.

## 3 Anytime Search

Weighted A\* but decrease  $w$  in each iteration of the algo finding better solutions with time.

## 4 Admissible Heuristics

Problem relaxation - ignore rules, increase possibilities and assumes a super-graph of actual state space.

## 5 Effective Branching Factor

1. Let A\* generate  $N$  nodes before finding solution at depth  $d$
2. Then, effective branching factor is  $b^* = \sqrt[d]{N}$
3. This is used to determine the efficiency of the heuristic

## 6 Combining Heuristic

1.  $h_2$  dominates  $h_1$  if both are admissible and  $h_2 > h_1$  for all nodes
2. Dominating heuristics perform better or same as non-dominating heuristics
3. Thus, we can take max of a set of heuristics to get a better performing algorithm
4. Heuristic functions form a lattice