



# CS 416

## Artificial Intelligence

### *Lecture 6*

### *Informed Searches*



# Chess Match

*Kasparov 1, Deep Junior 1, Draws 2*



# Compare two heuristics

$d$	Search Cost			Effective Branching Factor		
	IDS	$A^*(h_1)$	$A^*(h_2)$	IDS	$A^*(h_1)$	$A^*(h_2)$
2	10	6	6	2.45	1.79	1.79
4	112	13	12	2.87	1.48	1.45
6	680	20	18	2.73	1.34	1.30
8	6384	39	25	2.80	1.33	1.24
10	47127	93	39	2.79	1.38	1.22
12	3644035	227	73	2.78	1.42	1.24
14	–	539	113	–	1.44	1.23
16	–	1301	211	–	1.45	1.25
18	–	3056	363	–	1.46	1.26
20	–	7276	676	–	1.47	1.27
22	–	18094	1219	–	1.48	1.28
24	–	39135	1641	–	1.48	1.26

**Figure 4.8** Comparison of the search costs and effective branching factors for the ITERATIVE-DEEPENING-SEARCH and  $A^*$  algorithms with  $h_1, h_2$ . Data are averaged over 100 instances of the 8-puzzle, for various solution lengths.