

Computational Cube Theory

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Search Algs

- Uninformed
 - BFS, IDDFS, Bi-BFS, etc.
- Informed
 - A*, Bi-A*, Bi-ID-A*, etc.

What I've Done

```
[stephenhuan@MacBook-Pro:~/Programs/python/projects/cubing/solver> time pypy3 cube.py
```



```
706521 F2 U R' L F2 L' R U F2 9
```

```
real    0m34.471s
user    0m32.465s
sys     0m1.688s
```

Pretty cool, right? If it didn't take 30 seconds...

Kociemba's

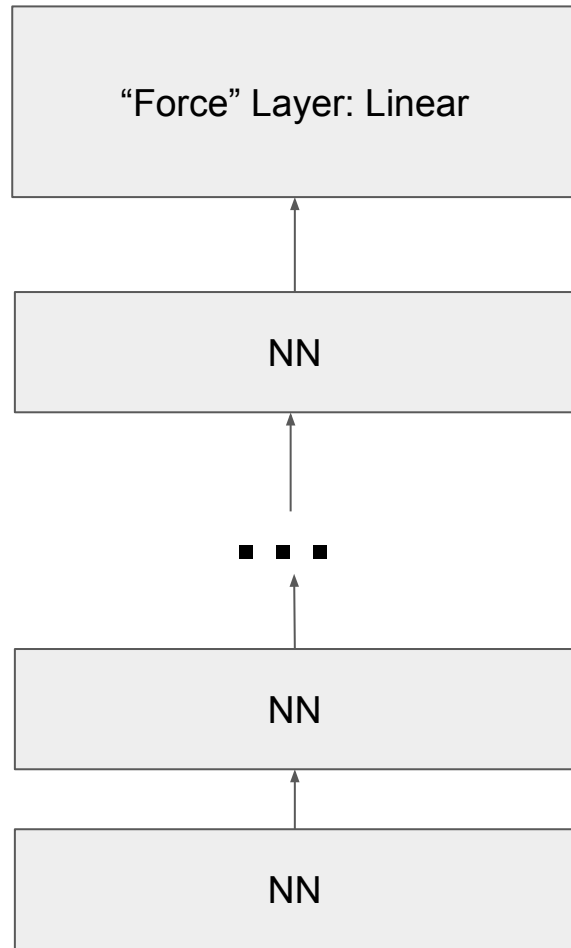
- Really cool
- Too complicated
- Ad hoc heuristics
- Not generalizable
- Big slow
- “If I have seen further it is by standing on the shoulders of giants”

Machine Learning

- Naive pure prediction
- Chad heuristic simulation
- Ultra high IQ reinforcement learning (RL)

“Gradient Boosting”

$f(x)$



Reinforcement Learning

- Pavlov's dog
- Markov decision process
- States, actions, rewards
- Increased viability recently