# Research Review

There have been many developments in the area of planning and search over the last few decades. The 3 that I found most interesting and relevant according to my research are the following:

First and foremost, one algorithm I found quite interesting was Warren’s WARPLAN (Warren 1974). It had multiple innovations that contributed to the AI community. First, it reorganized ordered plans so that different subgoals wouldn’t compete with each other, which came to be known as goal-regression planning. Second, it was the first program to be written in a logic programming language (in Prolog). Lastly, it is remarkable that it only used 100 lines of code, whereas its contemporary planning programs typically used thousands. It demonstrated to the world that you don’t need massive complexity to have a top-notch planner (AIMA 2003).

The second one is the UNPOP program by Drew McDermott (McDermott 1996). This program kind of changed the entire course of academic discourse for the AI Planning community. Before this program, partial-order planning dominated the academic circles as the right way to go for years. However, McDermott thought there were many other approaches that could be taken in planning problems, and thus he created UNPOP. The discussion McDermott created also enabled the discovery of many successful state-space search programs that came afterwards, the most famous and successful of which is Hoffmann’s FF program. Moreover, the UNPOP program is also the first one to use the ignore-delete-list heuristic, which became quite popular later (AIMA 2003).

And last but not least (and my favorite), I was mind blown by learning the technical details of AlphaGo, the system from Deep Mind that beat the world champion in the ancient game of Go (Silver, Huang et al, 2016). While this isn’t exactly a planning problem, it certainly brought a whole new perspective to state space search. What made it so incredible was the complexity of the possible states of the problem: there are more possible configurations of the board in Go than the number of atoms in the universe (about 10^170). Rather than using more traditional search methods such as A\*, AlphaGo used a combination of value networks and policy networks to choose its next move. It created a whole new dimensions of research, as many researchers are applying similar methods to many other domains since AlphaGo’s release.