Optimization in Real Life

As a researcher in computer science I try to create a resemblance between the concepts I study in machine learning and real life. Machine learning has a lot of maths but let us just ignore that and focus on high level concepts. Generally speaking, in machine learning the pipeline consists of a model, an objective function and an algorithm that attempts to maximize/minimize the objective function. The algorithm makes changes to the parameters of the model in order to achieve near-optimal results. But, how is that related to real life ?

In real life, we are in some way or another choosing our actions in order to optimize an objective function. As we learn to walk, we try to reduce the possibility of colliding our legs together and fall miserably. In simple terms, we are trying to minimize the objective function which calculates risk of falling. As we enter the war of the stock market we are trying to maximize the objective of earning money. The design of an objective function in real life is usually easy. However, the algorithm we take to do that might be long and rewarding or sometimes short and unethical. You might spend many years trying to learn about how the stock market works. You attempt to ask experts, learn more about stock models and possibly take some courses. However, as humans we are usually lazy. We try to do shortcuts which might allow us to ascend faster in our competition towards fame and popularity - maximize our objective function - but on the other hand we might go to jail if we don’t follow the law. In real life there are regularizers: upper/lower estimators that limit our algorithm to maximize and minimize the objective function. Health is a regularizer, you might get sick and stop earning money for a period of time. There are many other regularizers like time, family, law, etc. In our journey, we try to reduce these regularizers but they are there and we have to deal with them.

Theoretically speaking, we can design different algorithms to optimize objective functions. You can earn money by working as a doctor, engineer or like me in academia. Each one of us made that choice and we are trying to maximize our earning through our choice of design. Early on your career you might have chosen to go through college, graduate and then get a job. In your second year you decided that your design was incorrect, you dropped out college. We make these choices all the time; we might get lucky and succeed and more frequently we might fail and retry. As humans we are stubborn and try to navigate different routes into optimizations.

Sometimes, the design of an objective function is not in our hand. In a world where millions of people use social media, we don’t have much choice. These objective functions have been designed carefully by social media creators to encourage people to look for efficient algorithms for optimization. Our objective mostly is predetermined through a lot of flashy words: likes, retweets, views, favorites, followers, connections, etc. The creators of social media were very smart in designing these objectives. As you create your first account, you try to optimize these numbers because everyone does. Take twitter for instance, lots of likes, means lots of followers, verified, popular, sponsorships, ads and then wala you hit the jackpot. Content creators are forced to ask for likes, subscriptions, views, clickbaits in order to make money.

Our definition of right and wrong is changing according to different metrics in social media. Have you ever changed your way of tweeting because you didn’t get much likes? If a certain tweet will get you 1000 likes will you do it? regardless of the ramifications. Say, you are a creator on youtube and you made a video that got you only a couple of views. Then you made a completely different video that got you thousands of views. While the reason might be completely random you are determined to continue in the line of the second video. You want to make money and you want to make it fast. Our way of thinking is affected a lot by these metrics and our sole purpose is becoming to optimize them. As we try to optimize these metrics our virtues change because they might contradict with our objective function.

Most of the time we do follow the herd and do the same thing. We optimize the same objective function whether designed by us or other entities. We don’t question our actions and we just do them unconsciously. There is no quick way of getting popular, receiving praise or making money. Most of the numbers we look to optimize don’t make any sense and they are just consuming our soul. They make us lie, change our attitude, think uncritically and make unethical decisions.