The use of AI in video game adversaries.

Introduction

In nearly all multiplayer games, there is some element of competition or adversity involved. In chess, two players compete to outmaneuver each other’s pieces. In Settlers of Catan, players compete to earn resources and points while blocking others from doing so. The problem with this though is that they all require at least two people to play. Even then, if they have differing levels of ability then both players will get bored as one will find the game impossible to win and the other will not feel challenged. By moving games into the digital domain, we can attempt to address these issues. We can do this by allowing players to compete against an AI system where they normally would a human. This system can even be tailored to the players level of ability to maximize the enjoyment and engagement of the player. This solves both problems as at a moments notice, a player can play against an AI system that will suitably challenge them.

Expanding on this, using AI as a source of adversity in games can allow for entirely novel experiences by positioning the AI in a different position than that of just another player. Games that fall into this category are generally called Player Versus Environment (PvE) games as the motives of the AI and the player(s) are asymmetric. This works because there is no need to make the AI’s job in the game “fun” allowing it to orchestrate a mundane task that the outcome of which enhances the players experience.

Has AI been successful in this role?

AI has been very successful in this role; in fact AI has been a core tenet of video games almost since their inception. Arthur Samuel who coined the term “machine learning” did so in a paper about teaching a system to play checkers using a search tree and an evaluator in 1959. Ever since then, it has been used in both Player vs Player and Player vs Environment positions. (the first PvE games arrived in the 1970’s). Modern AI can now compete with even the even the best human players in numerous games including both games where the full state is known at all times such as chess and go and games where state cannot be fully observed such as StarCraft 2. In the modern day, nearly all games include AI (though it is less common in certain genres such as puzzle or idle games or where the social aspect of the game is too intertwined).

How can AI still be improved in this role?

As games get more and more complex over time with more realistic interactions and more complex behaviors, AI narrative characters has a tendency to lag behind other components of the game. This can be felt with static pieces such as a dialog tree where none of the presented options represent the players wishes but is more commonly felt in dynamic behaviors where the player is either playing with or against an AI. For instance, in 3d open world type games, AI’s often struggle to strategies around their environment and the other actors within and end up making bad decisions. For instance in a fight, they might run into the enemies while the player is hanging back healing. Often however, this is offset in some way, either by making the AI players weaker but more numerous (and removing any bearing the character has on the plot) which makes an individual loss not as painful or by having some other compensatory tactic such as that they can respawn when off screen. In the future, AI will almost certainly continue to be used and iterated upon using both simple techniques when appropriate but also cutting edge processes when warranted.