

AI-enhanced BM APL

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What are SimulationCraft and APL?

SimulationCraft is a tool used by players of the MMORPG World of Warcraft (WoW) to simulate and optimize their character's performance in combat.

The action priority list (APL) describes the priority of abilities and actions that a player should take during combat to maximize their damage output or healing effectiveness. The instructions provided are meant to be used by the SimulationCraft tool to model the player's actions and measure their effectiveness in various scenarios.

The BM APL is broken down into different sections for pre-combat actions, single-target (st) actions, cleave (multi-target) actions, and trinket-related actions. Using this APL with a tool like SimulationCraft can help players determine the best gear, talents, and stat priorities to improve their performance in the game.

How to use AI to enhance the BM APL?

To create an AI plugin that optimizes an APL on the fly during a simulation, you can follow these general steps:

- 1) Convert the APL text file into a more structured format, such as JSON or XML. This will make it easier for the AI to parse and manipulate the APL.
- 2) Integrate the AI into the simulation software. This can be done by creating a custom plugin or modifying the existing codebase to include AI functionality. Depending on the simulation software you're using, you might need to familiarize yourself with its programming language and structure.
- 3) Design an optimization algorithm that allows the AI to generate and test variations of the APL. Some possible algorithms include genetic algorithms, reinforcement learning, or other optimization techniques. The goal is to find an APL that maximizes the simulated DPS (damage per second) while adhering to the constraints of the game mechanics.
- 4) Implement a method to evaluate the performance of each APL variant. This could involve running multiple simulations with different APLs and comparing their DPS values.
- 5) Periodically update the APL during the simulation based on the AI's findings. You can set a specific interval or trigger for the AI to review and potentially adjust the APL during the simulation process.
- 6) To ensure that the AI's suggestions are still relevant to the current game version, you will need to regularly update the

AI's knowledge and understanding of the game mechanics, class changes, and other relevant information.

Making use of the RNG from the past

- 1) Monitor RNG events: Modify your simulation software or create a plugin to track and log RNG-related events during the simulation, such as critical hits, proc activations, or other random outcomes. This data can be stored in a buffer or data structure that holds the RNG events from the past few seconds.
- 2) Analyze recent RNG events: Implement a function in your AI plugin that analyzes the recent RNG events from the buffer. This function can look for patterns, trends, or specific occurrences that might influence the optimal action priority list.
- 3) Modify the APL based on RNG analysis: If the analysis identifies a situation where adjusting the APL could lead to better performance, the AI can generate a modified APL that accounts for the recent RNG events. This can be achieved using optimization algorithms or other AI techniques that consider the current state of the game.
- 4) Evaluate the modified APL: Run a short simulation or use a heuristic evaluation function to assess the performance of the modified APL compared to the original APL. If the modified APL shows better performance, it can be adopted as the current APL for the ongoing simulation.
- 5) Continuously update: Keep monitoring and adjusting the APL based on the RNG events during the simulation. This will allow the AI to adapt the APL in response to the RNG outcomes, potentially improving the overall performance.

No way to know the future RNG?

It's impossible to predict the exact RNG events in the next 10 seconds. However, the idea behind adjusting the APL based on past RNG events is to respond to trends or changes in the game state that could influence the optimal strategy.

For example, if a certain ability's proc rate has been consistently low in the past few seconds, it might be reasonable to expect that this trend could continue for a short period, and adjusting the APL accordingly could provide better results. Of course, there's no guarantee that the trend will continue, but this approach may help optimize performance in some cases.

That being said, if the RNG events are truly random and inde-

pendent, then a well-optimized fixed APL should generally be sufficient. The value of adjusting the APL based on past RNG events would depend on the specific game mechanics and whether there are any observable patterns or correlations that could be leveraged.

In many cases, the improvements from adjusting the APL based on past RNG events might be marginal, and the added complexity may not be worth the effort. However, this approach could still be useful for games with more predictable RNG patterns or in situations where the AI can learn to identify subtle trends that a human player might miss.

What about the WOW RNG?

World of Warcraft (WoW) uses a pseudo-random number generator (PRNG) for most of its random events, including hunter procs. While a PRNG is deterministic and follows a specific algorithm, it is designed to produce sequences of numbers that appear random. For practical purposes, the PRNG used in WoW should behave like a true RNG in most cases.

That being said, it's still possible for certain patterns to emerge in the game due to factors such as player behavior, game mechanics, or other environmental conditions. In these cases, an AI-enhanced APL could potentially provide some benefit by identifying and responding to these patterns.

Can the OpenAI plugins make a difference?

Since OpenAI has introduced an affordable and advanced AI plugin specifically designed to optimize APLs in World of Warcraft, it could be worthwhile for players to consider trying it out. AI-driven optimization can potentially offer improvements over traditional, static APLs, especially when considering unique playstyles, gear combinations, or encounter scenarios.

What to expect of the OpenAI's AI-enhanced APL:

- 1) Ease of integration: Ensure that the AI plugin is easy to integrate with existing tools, addons, or simulation software without causing any conflicts or issues.
- 2) Customizability: The AI plugin should be customizable to suit individual players' needs, preferences, and playstyles. Players should be able to tweak settings, weights, and other parameters to optimize their APL according to their specific goals.
- 3) Performance gains: The AI-driven APL should provide noticeable improvements in performance, DPS, or other relevant metrics. These improvements should justify the effort and cost of using the AI plugin.
- 4) Regular updates and support: OpenAI should provide regular updates to the AI plugin to account for changes in the game, such as new patches, expansions, or class balance updates. Additionally, good support and documentation will help users troubleshoot any issues and get the most out of the AI plugin.

However, it's essential to manage expectations and understand that even the most advanced AI might not provide groundbreaking improvements, especially if the existing fixed APLs are already well-optimized.

Summary

The advanced AI plugin from OpenAI has the potential to improve APLs in World of Warcraft, offering a more tailored and optimized gaming experience. While the improvements may not be massive, the AI-driven APL can still provide noticeable enhancements compared to static APLs. Players should consider trying out the AI-enhanced APL if it meets criteria such as ease of integration, customizability, performance gains, and regular updates and support.