Generic Dynamic Difficulty Adjustment Algorithm

# Previously Outlined Specification

A Generic Genre Agnostic Algorithm, written in plain English – explaining how to use previous player data, create foundational player models and measure in-game performance.

“Looking at the various techniques and technologies in this paper, there are many ways to dynamically adjust gameplay to tailor to players. However, there does seem to be a lack of DDA for competitive multiplayer games, aside from Baldwin et al.’s framework. By creating a generic genre agnostic algorithm in plain English – explaining how to use previous player data, create foundational player models and measure in-game performance – it would show developers that these techniques can be adapted to these types of game. Therefore, assisting them in easily analysing and identifying effective DDA techniques to use in their games.

To truly ascertain the effectiveness of the algorithm a competitive multiplayer game will be created. A Two Team Geometric Realtime First Person Shooter game will be made, where two players fight against one another in opposing teams of 3, each team having 2 AI agents. Both the AI agents and the players themselves will be affected by DDA. The players having their parameters adjusting – such as health, speed, damage – as well as unique mechanics such as aim assist or powerups. The AI agents using an agent adapted from the CSRL agents used in Andrade et al.’s research.

Both of these components should illustrate the advantages of DDA in competitive multiplayer games and create ease of use for future development of these games.”

# DDA

Tiering system that gives individual players certain benefits depending on their performance.

Aim Assist, Powerups, Minor Speed Boosts.

Tiers of Adjustment:

Tier 1 – Minor Speed Boost, Slightly More health

Tier 2 – Better Speed Boost and Health, Slight Aim Assist (minor magnetism), Enemy AI agents actively play worse around you.

Tier 3 – Maximum Speed Boost and Health, Slight Damage Boost, Aim Assist as above, powerups are better when you pick them up compared to other players.

Adjust Tier System

Adjust Difficulty Horizontally, subsystems that target areas of player weakness such as accuracy, navigation, combat

Save using Unity Player Prefs

# Resources

Baldwin, A., Johnson, D., Wyeth, P. and Sweetser, P., 2013, September. A framework of dynamic difficulty adjustment in competitive multiplayer video games. In *2013 IEEE international games innovation conference (IGIC)* (pp. 16-19). IEEE.