

Review on Artificial Intelligence based Virtual Game Programs

¹Satya ranjan Das, ²Santosh Behera

Abstract--- *A significant percentage of individuals actively play computer games. In the amusement profession, gambling is growing faster every day. For fact, where there is human intelligence, both the customer and the living individual are concerned. Artificial intelligence is therefore extremely important if the game is more engrossing and customer-friendly. Because of the mobile phone boom, it can be observed that games are moving from boards to finger-held displays. In previous decades, great progress has been made in the field of Artificial Intelligence (AI). It is somewhat a flourishing area of work with a growing couple of crucial research areas as well as a reference implementation for a growing number of fields of implementation. In order to increase calculating strength due to hardware advances, AI frequently shows a rapid development, along with algorithmic innovations. AI has many practical uses in which the positive stories can be encountered in our everyday lives. Advances from AI have made it possible for users to learn pictures and expression, anger tracking, auto-driving cars, web page, AI-assisted creative design, multiplayer and several others.*

Index Terms--- *Artificial Intelligent, user friendly, references, multiplayer, algorithmic innovations, pictures and expression, auto driving vehicles.*

I. INTRODUCTION

For computer games, artificial intelligence (AI) is generally employed in single-player characters, different from human intellect, to produce sensitive, reactive and intelligent behaviour. Since its founding in the 1950s, board games have been made up of artificial intelligence. After its implementation, the role of AI in computer games has grown significantly [1]–[3].

Modern games often use proven artificial intelligence technologies, such as track finding and decision-making to direct NPC behaviour. AI is commonly used in processes, such as big data as well as procedure material millennium that are not easily visible to the user. The history of gaming including artificial intelligence is lengthy. A lot of AI studies for matches focuses on building play officers with and without a learning element [4]–[6].

That was the first and only method to the AI use in matches traditionally for a long time. Nikola Tesla, arguably the main computer discoverer, (re)invented and played chess on the minimax neural network. Today, games and intelligence go side by side. Ludo is a smart mind game [7]–[9]. In recent years, there has been a major increase in interest in the application of AI technologies for game consoles (see, for instance, latest conferences on Game AI collaborations such as ICCBR 2015 and IJCAI 2018). Nevertheless, the overwhelming majority of this research works on smaller sub-

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Department of Computer Science and Engineering, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, satyadas@soa.ac.in, santoshkumarbehera@soa.ac.in

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problems inside a board game (small tactical issues, teamwork, route planning, etc.) or is not part of a real match. Whereas this research generates fascinating alternatives and concepts, it cannot be linked directly to computer game companies. For increasingly large project teams creating computer games, game developers have no periods left to test and turn these technologies into their own games. They have extremely short timeframes.

For various moves to be undertaken, it demands some basic knowledge. Game theory bridges the gap between complexity and simplicity. Game theory is the theory. It is a tool for modelling which has some rules for implementing the game. There are different types of game theories implemented, which can provide a solution, from live users to business users [10]–[13].

The central principle of game theory and related games have been included in this article. It is linked to artificial understanding. The earliest study was on typical computer games like Scrabble as well as Chess. The birth was that those matches, where good intricacy can come from basic rules and that for thousands or even millions of decades had questioned the hardest of the natural world.

In 1994, the Chinook Checkers team defeated Marion Tinsley, the World Scrabble champion, after more than three years of research on quest for trees; the game was finished in 2007. Chess has been viewed for decades as the "drosophila of AI" in that it was the "model organism" which has tested innumerable new AI techniques. The backgammon program called TD-Gammon, created in 1992 by Gerald Tesoro is a landmark in AI research into games only a few years before the achievements of Deep Blue and Chinook.

TD-Gammon uses an artificial neural network, equipped by playing backgammon a few million times, through temporal differential learning. TD-Gammon succeeded in playing backgammon at a top human backgammon player level. Watson was a software system that answered questions in natural language after Deep Blue IBM's next success story. Watson played on the Jeopardy in 2011! TV game and raised one million dollars over previous game winners.

The connections and brainstorms as game and intelligence are strong. Many people have tried very hard to transform the game into systems. A full description of how to solve a game with AI was presented. It discussed search methods as Alpha-Beta pruning, minimax algorithm and tree structure games as solution strategy.

A detailed explanation and application of game theory was given by Georgios N. Yannakisin. He addressed AI and its four flagships and advised on the terms used at sports. But typical board games aren't the only ones in the country with their discreet mechanisms, and if the full state of this year's games can be seen by the two players, and intelligence is more important than what traditional board games can reward.

Thus a research team has grown up over the last 10 and a half years to apply AI to other games, especially video games. Much of the study in this community concentrates on developing AI for games—either as effectively as possible or in the man-made style or in certain other properties.

Let's first explain sporadically a few of the biggest problems arising from the development of artificial computer games intelligence. This list is not complete, but aims to give the AI community a taste of the types of problems true

computer games present as illustrated in table 1.

Table 1: Issues in AI games

Complex decision spaces	Most state-of-the-art computer games involve complex strategic (real time strategy games) or believable behaviors (interactive dramas). Both kind of behaviors share the characteristic of having huge decision spaces, and thus traditional search-based AI techniques cannot be applied.
Knowledge engineering	Even assuming that strategies or behaviors are handcrafted, authoring these behavior sets in a game requires a huge human engineering effort.
Authoring support	Hand crafted behaviors are, ultimately, software code in a complex programming language, prone to human errors. The behavior errors could be in the form of program "bugs" or not achieving the desired result.
Unanticipated situations	It is not feasible to anticipate all possible situations and player strategies that can encountered during game play. This makes it difficult to craft believable behaviors that react in an appropriate manner to these unforeseen circumstances and player actions.
Replay ability and variability	A player might get bored of seeing the same strategies and behaviors again and again. Although simple variability can be achieved through stochastic selection of behaviors or strategies from a large repository, this increases the authoring burden.

II. TWO PLAYER PROTOCOL

The two player game is an algorithm, which means the first player is called PLAYER 1 as well as the second player is called PLAYER 2. Every node's value is supported by its children. With PLAYER 1, the backup value is its children's maximum value and for PLAYER 2 the backup value is their children's minimum value. It is the most successful move to PLAYER 1, so that PLAYER 2 is in the best position. It is a recursive algorithm that takes place at each step of the same processes.

III. LUDO: A CASE STUDY

Ludo says, "I play." "I play." This comes from an old Indian game, known by the name "Parcheesi." It's a two, 3 and 4 players board game. In this game the players are battling their four tokens according to the roll of a dice played by the four players:

- Red
- Blue

- Green
- Yellow

Each player is putting a single area of a colour, with a board divided into four key zones. In this four took of his chosen colour are given to him, which he will run about to win.

The Ludo board is normally a bridge-shaped squares with the game direction. That arm throughout the symbol here is made up of three rows separated into two squares— normally six squares in one row. There will be five yellow places in the top row of each part, comprising the player's home row.

A sixth painted square is not really a square for the home line, it is the starting point of each team. In the centre of the table, each player has a large square. A player with all four tokens reaches this area, he wins. Two, three or four players can play this game. The tokens under each player are unplaced at the start of the game and remain in the colour that is usually referred to as player's court in one of the wide corner.

Just one token will reach a specific starting square and travel in the clockwise direction accordingly in a roll of a dice, circling the whole board until it gets to the squares in the room.

IV. GAME PLAY (WORKING METHOD)

The dice slide continues the game. Every player has an opportunity to move one by one. A "6" on dices allows a player to reach the playing area of the game. By moving the token the turn is converted. If the striker has far more than another bauble in the game, he is able to select which player will be able to compete on the track with Q-learning.

Here AI is forward to, if there is a token of the opponent, this research paper had try to keep this token safer because another token will be a chance to race. Here, too, a fight continues to glisten if a defender is given a "6" in the dice roll. Then, a bonus opportunity to roll up the dice too is offered. In addition, if a player takes the token of the adversary already, the token of the opponent should be out of the game, and it must restart the game from the very start.

That square block is given an index here, many of them are safe states. Now we're starting with a yard of one colour. Index "1" is given for the very first block of the yellow yard of the track zone and the adjacent cells are indexed continuously. So, every yard consists of 12 cells.

V. CONCLUSION

The review paper had tried show the brief game theory description. In addition, this review paper has shown certain game characteristics. Then this review paper gave a brief about Artificial Intelligence and AI games. The review paper then addressed game searches in algorithms primarily used for Ludo. And then, Ludo description is described as a case study, where the algorithm is optimized to use smaller indicators so that it is less complex to guess the number of the tack and then to calculate it, following the colour indexing and assignment.

REFERENCES

- [1] "1. Introduction to Game AI - AI for Game Developers [Book]." [Online]. Available: <https://www.oreilly.com/library/view/ai-for-game/0596005555/ch01.html>. [Accessed: 15-Nov-2019].
- [2] G. N. Yannakakis, Game AI Revisited. .
- [3] C. Otieno, G. Okeyo, and S. Kimani, "Coupling Measures for Object Oriented Software Systems-A State-of-the-Art Review."
- [4] "Artificial Intelligence & Game Development: Recent Trends." [Online]. Available: <https://becominghuman.ai/artificial-intelligence-game-development-recent-trends-a08a67769a63>. [Accessed: 15-Nov-2019].
- [5] "How is artificial intelligence used in video games?" [Online]. Available: <https://www.techopedia.com/how-is-artificial-intelligence-used-in-video-games/7/33419>. [Accessed: 15-Nov-2019].
- [6] "How AI will revolutionize the way video games are developed and played - The Verge." [Online]. Available: <https://www.theverge.com/2019/3/6/18222203/video-game-ai-future-procedural-generation-deep-learning>. [Accessed: 15-Nov-2019].
- [7] "Building an AI that Can Beat You at Your Own Game - Towards Data Science." [Online]. Available: <https://towardsdatascience.com/pathwayz-ai-3c338fb7b33>. [Accessed: 15-Nov-2019].
- [8] "Video Games as a Perfect Playground for Artificial Intelligence." [Online]. Available: <https://towardsdatascience.com/video-games-as-a-perfect-playground-for-artificial-intelligence-3b4ebee36ce>. [Accessed: 15-Nov-2019].
- [9] D. R. Prashanta and K. Patra, "LECTURE NOTES ON ARTIFICIAL INTELLIGENCE PREPARED BY."
- [10] F. Aiolli and C. E. Palazzi, "Enhancing artificial intelligence in games by learning the opponent's playing style," in IFIP International Federation for Information Processing, 2008, vol. 279, pp. 1–10.