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Learning Tactics and Make Hack-Free Real Time Strategy Games Using AI

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ABSTRACT: Artificial Intelligence tactics have been successfully applied to several computer games. However, in real time strategy games, traditional AI fails to play at human level because of vast search spaces that they entail. Here we present the real time case-based planning and execution approach designed to deal with RTS games. Also, we are going to learn probabilistic behavior models in RTS. Building a human level AI to beat the human player. In this paper we see how to prevent cheating or hacking in RTS games, Strategies to limits the state exposure to client. Discuss about cheating Hack-free gaming environment using different toolkits. We also have done a public survey about what changes they would love to see an RTS games using AI.

KEYWORDS: RTS, ORTS, Tactical Assault Battles, Hacking, Cheating, Information Exposures to Cheaters, Influencing Maps.

I. INTRODUCTION

AI research in RTS games has a great history. The first RTS games started in early 1990s with the title such as Warcraft, Command and Conquer. Researcher have been working on building bots capable of defeating the best human players, but still have a long way to go. Basically, RTS games are simplified military simulations where the player must defeat the opponent by commanding virtual troops into a battlefield by making strategies in real time.

The goal of this paper is to gain knowledge about RTS games, Evaluation of AI bots, And hack-free RTS game. Also, the public survey has been done to know the opinion about hackers and the interest in the game.

Further in this paper, we will see related work of AI in RTS games, Methodologies, Experiments, Result, And the conclusion of this research paper.

II. RELATED WORK

Previous related work under AI in RTS games are as follows: In [1,16] Buro, M. et al. proposed that AI researched in the area of real-time strategy (RTS) games and describes the current situation of a project whose goals were to implement an RTS game programming environment and to build AI's which could outperform human experts in this challenging and popular domain. In [2] R, B. suggested that in future, the online planner could be extended in several ways to increase the performance and to produce better results. Also approaches on a range of tactical assault problem with different objectives. In [3] Schadd, F. et al. proposed an approach of opponent modeling based on hierarchically structured models. And experiments that test the approached were perform in the RTS game spring. In [4] Dereszynski, E. et al. explored a probabilistic framework, based on hidden Markov models, for learning and reasoning about strategic behavior in RTS games. Also demonstrated an approach by learning behavior models from 331 expert level StarCraft games. In [5] Weber, B. et al. analyzed the domain and identified several of the capabilities required for expert StarCraft gameplay. In [6] Buro, M. discussed about AI challenge in the area of real time strategy games and presented a research plan aimed at improving AI performance in RTS games. In [7] Webb, S. et al. proposing peer to peer(P2P) architecture rather than

C/S(Client/Server). Also discussed various P2P protocols that prevent cheating. In [8] Chambers, C. et al. proposed the tactics for detecting map-hacking based on bit commitment and explores the tradeoffs in network traffic and information exposure inherent in reducing information exposure on peer-to-peer games. In [9] F. R. Cecin et al. argued that the free MMG supports scalable, cheat-resistant, massively multiplayer RTS games using a lightweight server that assigns the bulk of the game simulation to the clients. Example is FreeMMG Wizard. In [10] Avery, P.(n.d.). et al. described the tactics have been very low level – who to attack and where individual boats should move. And implemented levels of a strategic/tactical hierarchy, representing different planning levels. In [11] Laurens, P. et al. approached to detection of cheating players and a proof-of-concept system designed to detect cheating play through the analysis of player behavior. In [12] Webb, S. et al. stated various state dissemination strategies for online games comparing them based on excess state exposure, user delay perception, and system requirements. In [13,15] Buro, M. et al. mentioned an idea to replace popular but inherently insecure client-side game simulations by server-side game simulations. Only visible part of the game state is sent to the respective clients. So, there are less chance of server getting hacked. In [14] Wintermute, S. et al. the middleware developed by them supports grouping, attention, coordinated path finding, and FSM control of low-level unit behavior. Agents used this system won two out of three categories in the AIIDE 2006 ORTS competition. In [18] Cond, C. et al. described that the structure and behavior of an artificial intelligence bot capable of playing StarCraft which was developed to participate in the AIIDE 2010 StarCraft Competition. In [19] Kim, k. et al. proposed experiments which predicts unknown strategy with 10-fold cross-validation accuracy 99% using 15 minutes of game playing by K-Nearest Neighbor classifier.

III. METHODOLOGY

An online survey was held using Google form. The link of the form was circulated in social media platform. The questionnaires in the form were designed to test that any user has faced any hacker and do they have same interest in the with hackers.

i. Participants

A total of 36 participants data was collected. In which 72.2% (26) were said that they faced hackers and 27.8(10) were said they have not faced any hackers.

Have you faced any 'Hackers'?

36 responses

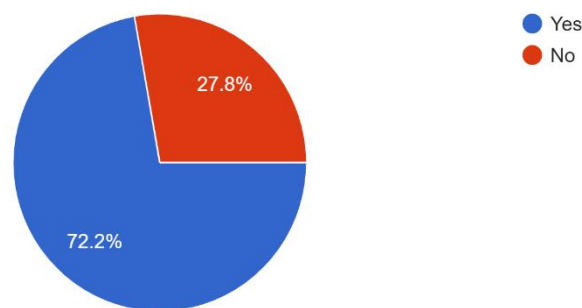


Fig (a) response for faced hackers

ii. Measures

Participants were asked to choose do they have same interest in the RTS games with hackers.

Do you have the same interest in game with hackers?
36 responses

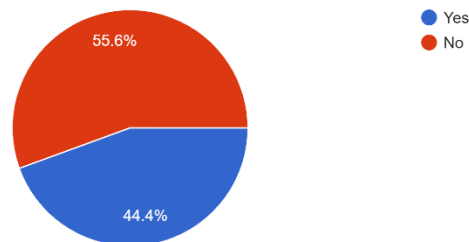


Fig (b) response for interest of the game

IV. EXPERIMENTAL RESULT

The survey data was collected and solved by CHI SQUARE TEST with 0.05 significance level. We checked whether there is relation between χ^2_{tabular} and interest in the game.

We choose,

Null hypothesis= There is no significance relation between hackers and interest in the game among participants.

Alternative hypothesis = there is significance relation between hackers and interest in the game among participants.

$$\chi^2_{\text{tabular}} = 6.314, \chi^2_{\text{calculated}} = 0.0955$$

The data samples were calculated using CHI SQUARE TEST and the survey analysis resulted that there no significance relation between hackers and relation in the game.

V. COCLUSION

In RTS gams, a user wants a hack-free game. According to survey conducted, most of the user faced hackers but it doesn't affect their interest in RTS games. Researcher has helped to build a strong AI. But still there's lot to improve, solve problems like as per the analysis 72.2% people faced hackers. Also, we discussed the tactics for assault battles in RTS games which increases performance and improve the result.

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