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**Topic: AI/Machine Learning**

**Article: Artificial Swarm Intelligence vs Vegas Betting Markets**

**Citation: L. Rosenberg and G. Willcox, "Artificial Swarm Intelligence vs Vegas Betting Markets," *2018 11th International Conference on Developments in eSystems Engineering (DeSE)*, Cambridge, United Kingdom, 2018, pp. 36-39.**

**Summary of Article:**

The article is about Artificial Swarm Intelligence (ASI) and how forming a closed-loop system will provide better results than crowd-based methods. A software platform, swarm.ai, was used to connect all the participants across the world to form a closed-loop system. They were then asked to pick the winners between 200 NHL games against Vegas betting odds. It was determined that the ASI system was accurate 85% of the time compared to the 62% Vegas model. Using betting pools, the Vegas model generated a 41% financial loss while the ASI model gained 170%.

**Article Purpose:**

The article’s purpose was to argue that humans can predict better as a swarm vs crowd-based by applying Artificial Swarm Intelligence. Swarms is modeled after biological systems such as schools of fish, flocks of birds, or swarms of bees where each individual decision is effected by others. The article demonstrated that by using a swarm software, humans can mimic swarms and outperform Vegas betting odds.

**Methodology**

In a duration of 20 weeks, a weekly group consisted of 25 to 36 sports enthusiasts around the world used swarm.ai to predict the winner of 10 hockey games. This results in 200 total games. Swarm.ai used a magnet diagram interface and the participants all select the winners simultaneously. Between the 10 games, each participant can pick the winner and winning margins (either 1 or 2+). Afterwards, the participant choose the team that will most likely win their game in the week. A betting pool of $100 was created for ROI computations. The results after 20 weeks were then compared to the Vegas betting odds.

**Conclusion**

The authors found that Artificial Swarm Intelligence is much more accurate than crowd-base model and the Vegas model. After 20 weeks and 200 games, ASI achieved 85% accuracy in correctly predicting the winner compared to 62% based on Vegas odds. The probability that the swarm will outperform the Vegas Odds by chance was low at 0.0057 so this indicated a significant result. After applying the betting pool of $100, it shows that ASI was generating a ROI of 170% while the Vegas model was at a loss. So in conclusion, the ASI model is superior to crowd-based or the Vegas model.

**Article Strengths:**

The article did a great job to persuade the readers that ASI is the better model. Not only did it provide the study used but it provided but it provided a monetary comparison with ROI between the two models. It put into perspective how impressive the ASI model is when it comes to accurately predict a game.

**Article Weaknesses:**

There was not much explanation about how swarm intelligence was implemented and what kind of algorithm was involved. I think the paper would made a better argument against crowd-base if the reader knew something about the algorithm. It can then be compared to crowd-base algorithm. Other than that, the sample size is quite small and the subject used might not be enough to provide concrete results. I would like to see ASI applied to other sporting games and their Vegas odds.

**Recommendation:**

The results were strongest when the ASI system was tasked with picking the winner of the week that was most likely going to achieve the predicted outcome. Even though the results were impressive, additional work is being conducted to optimize the heuristic as there is room for improvement. The article didn’t mention much about the actions needed to improve the ASI model.

**Checklist:**

Number of Authors: 2

Number of Citations of Article: 13

Number of Citations to other articles: 1

Methodology Explained (Yes/No): Yes

Technology Explained (Yes/No): Yes

Experiments and Data Reviewed (Yes/No): Yes

Conclusion Exist (Yes/No): Yes

Recommendations Exist (Yes/No): Yes