#THANKTHESTRIPES

Artificial Intelligence in Officiating

This year's theme of #thankthestripes is "Artificial Intelligence (A.I.) in Officiating". This article is not about arguing for or against A.I., but rather to provide information. Enjoy!

Artificial Intelligence in General

Artificial Intelligence (A.I.) is spreading at such a rate that a definition is, perhaps, not necessary as people may already "know A.I.". However, to set the stage for this discussion, we can consider A.I. to be ***the ability of a machine to display human-like capabilities such as reasoning, learning, planning and creativity... capable of adapting their behaviour...by analysing the effects of previous actions and working autonomously.***"[1]

Artificial Intelligence continues to grow in its application. Geoffry Hinton, 2024 Nobel Laureate in Physics for his work in A.I., says "It's going to be fantastic, which is why progress is not going to be stopped. ***I don't think we can hit a pause button on A.I.*** because there's so many enormous benefits from it."[2]

Indeed, A.I. is part of our lives with ChatGPT, internet search and advertisement algorithms, virtual assistants and smart home tech, and self-driving cars plus a much longer list that is beyond the scope of this article. The spread of A.I. use has also led the Federal Government to identify low-risk and high-risk activities to combat its malicious or risky use.[3] Ultimately, when it comes to A.I., ***humility is very important because "...We have no experience of what it's like to have things smarter than us.***"[4]

A.I. use for Player and Team Development

A.I. has been adopted into the sporting community for aiding in athlete development. Here are some examples:

- Biometrics can be tracked using smartwatches, GPS vests and sensors placed on a player's body. This is used to plan training, reduce injury risk, and assess efficiency.[5]
- In-game decision making can be analyzed post-match and during matches to provide players with feedback as individuals and as team members.[6]
- Virtual environments are used to help players visualize playing the game.[7]

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[1] https://www.europarl.europa.eu/topics/en/article/20200827STO85804/what-is-artificial-intelligence-and-how-is-it-used
[2] https://www.cbc.ca/news/science/nobel-prize-physics-2024-1.7344607
[3] https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/guide-use-generative-ai.html#toc-4
[4] https://www.cbc.ca/news/science/nobel-prize-physics-2024-1.7344607
[5] https://www.datacamp.com/blog/ai-in-sports-use-cases
[6] https://www.datacamp.com/blog/ai-in-sports-use-cases
[7] https://www.datacamp.com/blog/ai-in-sports-use-cases

A.I. use for Officiating

A.I. is being applied to assist officials in making calls. Here are some examples:

- Tennis uses A.I. (specifically "Hawkeye") for *identifying a ball as "in" or "out"*.[8]
- The NBA uses A.I. to increase accuracy of *foul calls*.[9]
- MLB applies A.I. for tracking *ball and strike locations*.[10]
- The NFL *reviews close calls* with A.I.[11]
- The NHL implements A.I. to *confirm goals*.[12]
- The PGA taps into A.I.'s potential to *accurately identify penalties*.[13]

These examples do not remove human officials from the game. The technology to do so is being explore and some have predicted *that human referees could be replaced by robots and A.I. by the 2050s*.[14]

Benefits and Risks of Replacing Officials with A.I.

The question about removing human officials, as with all decisions, is "do the benefits outweigh the risks?" The primary arguments for A.I. officials are:

- *reducing human decision-making error* by removing the human referee,
- and *reducing delays* from humans reviewing video to confirm or overturn a call.[15]

The primary arguments against A.I. officials are:

- Matches are **more easily fixed by rewriting code** compared to influencing a human official,[16]
- Humans are involved in writing the code so *there will always be human error*,[17]
- Refs do more than apply rules. *Refs manage conflict. A.I. may or may not be able to manage conflict.*
- Over reliance on A.I. will lead to *a decline in human ability* to manage games,[18]
- A.I. glitches could lead to *game cancellations* or wildly *inaccurate officiating*,[19]
- *Loss of tradition* as people believe "human error is what makes the game great."[20]

[8] https://imaginovation.net/blog/ai-in-sports-industry/
[9] https://imaginovation.net/blog/ai-in-sports-industry/
[10] https://imaginovation.net/blog/ai-in-sports-industry/
[11] https://imaginovation.net/blog/ai-in-sports-industry/
[12] https://imaginovation.net/blog/ai-in-sports-industry/
[13] https://imaginovation.net/blog/ai-in-sports-industry/
[14] https://www.independent.co.uk/sport/football/var-brentford-brighton-premier-league-serie-a-b2404962.html
[15] https://medium.com/@evanledoux04/refereeing-the-future-the-integration-of-ai-in-sports-officiating-f8aff45fb290
[16] https://www.vanderbilt.edu/jetlaw/2023/11/13/artificial-intelligence-referees-offsides-and-out-of-bounds/
[17] https://www.vanderbilt.edu/jetlaw/2023/11/13/artificial-intelligence-referees-offsides-and-out-of-bounds/
[18] https://medium.com/@evanledoux04/refereeing-the-future-the-integration-of-ai-in-sports-officiating-f8aff45fb290
[19] https://medium.com/@evanledoux04/refereeing-the-future-the-integration-of-ai-in-sports-officiating-f8aff45fb290
[20] https://medium.com/@evanledoux04/refereeing-the-future-the-integration-of-ai-in-sports-officiating-f8aff45fb290