Generating Visual Analytics And Player Statistics For Soccer

Tech ID: 32683 / UC Case 2018-549-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,046,038	07/23/2024	2018-549

FULL DESCRIPTION

Background

Identification of next generation sports stars is an important responsibility of a coach. Talent identification has been traditionally based on viewing athletes in a trial game or training session environment. A coach's subjective preconceived notion of the ideal player may result in misjudgments and inconsistencies. In team-based sports, such as soccer, talent identification is a complex process due to different qualities associated with performance including personal and tactical attributes.

Current Invention

Researchers led by Prof. Bir Bhanu at UCR have designed a patent pending system to automate talent identification by generating visual analytics and player statistics for soccer from a video using traditional machine learning algorithms and deep learning techniques for computer vision. Specifically, they have developed:

- An approach to generate player analytics and statistics from videos of soccer matches.
- Convolutional Neural Networks for dynamic identification of players controlling the ball.
- Strategy to train Generative Adversarial Networks to augment and improve the performance of the system.
- Generalizable approach for use during different scenarios of the game.



Example scenarios of players with and without the ball

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OTHER INFORMATION

KEYWORDS

Computer vision, Convolutional Neural Networks, Generative Adversarial Network, Soccer, Video analytics, Talent identification, Soccer player coaching, Player development, Player tracking

CATEGORIZED AS

- Computer
  - Software

RELATED CASES

2018-549-0, 2019-762-0



Sample image of the grid-based localization technique used in the invention

ADVANTAGES

The system and approach that the inventors have developed, now provides:

- An approach to generate player analytics and statistics from videos of soccer matches.
- Convolutional Neural Networks for dynamic identification of players controlling the ball.
- Strategy to train Generative Adversarial Networks to augment and improve the performance of the system.
- Generalizable approach for use during different scenarios of the game.

SUGGESTED USES

- Video analytics in sports
- Talent identification in sports
- Player development in sports
- Game strategy development in Soccer

STATE OF DEVELOPMENT

Proof of concept prototype developed and tested. The testing displays an impressive 92.57% ± 2.92% accuracy in identifying teams. For player analytics their accuracies were, in each case:

- 84.73% - for easy scenarios - 4 – 5 players spread wide apart, e.g., in the defense zone.
- 79.82% - for moderate scenarios - 6 – 10 players in the midfield.
- 67.28% - for hard scenarios - more than 10 players in a small area - e.g., during an attempt at a goal.

INVENTIONS BY BIR BHANU

Inventions by Bir Bhanu

RELATED MATERIALS

- Soccer: Who Has The Ball? Generating Visual Analytics and Player Statistics

RELATED TECHNOLOGIES

- Automatic Dribbling Action Recognition in a Sports Game

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