



SportSpecs : Unravelling Athletic Prowess with Advanced Transfer Learning for Sports

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ABSTRACT

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The "SportSpecs: Unraveling Athletic Prowess with Advanced Transfer Learning for Sports" project explores innovative methods to enhance athletic performance analysis through transfer learning. In the modern sports landscape, analyzing complex performance metrics and gaining valuable insights is essential for athletes and coaches aiming to achieve peak results. However, traditional analysis methods often struggle with the complexity and variability inherent in sports data. SportSpecs addresses this gap by leveraging pre-trained deep learning models, adapting them to understand and predict athletic performance across various sports.

INTRODUCTION

SportSpecs aims to revolutionize the analysis of athletic performance by leveraging advanced transfer learning techniques. This project will explore innovative methods to assess and predict athletic prowess, providing insights that can enhance training, strategy, and performance evaluation.

METHODOLOGY

For SportSpecs, we started by collecting and preprocessing sports images, resizing them to 224x224 pixels, and applying data augmentation (e.g., rotation, flipping) to enhance model robustness. We selected VGG16, VGG19, and ResNet50 as our models, using transfer learning to adapt them for sports classification. After tuning parameters and training, we found VGG16 performed best, achieving 82.4% accuracy, making it our final model choice.

IMPLEMENTATION

● Model Deployment and Web Application

Developed a Flask web application for real-time image classification. Enabled users to upload sports images and receive an instant prediction. Processed images to prepare them for prediction (resizing, preprocessing).

● User Interface And Result Display

Designed a simple, interactive interface to upload images and display predictions. Output includes predicted sport category and confidence scores, providing users with easy-to-understand results.

IMPLEMENTATION

● Future Enhancement

Model Improvement: Enhance accuracy with additional data and advanced architectures.

Real-Time Feedback: Integrate data from wearable devices for live analysis.

Expanded Sports Categories: Plan to include a wider range of sports as data becomes available.

RESULT

The SportSpecs project achieved strong results, with the VGG16 model delivering the best accuracy at 82.4% for sports classification, outperforming VGG19 (74.6%) and ResNet50 (20.8%). The model was effectively deployed via a Flask web app, enabling real-time sports image predictions with confidence scores for user insights. This success shows the potential of transfer learning in sports analytics, with future enhancements planned to improve accuracy and expand the range of classified sports.

CONCLUSION

SportSpecs demonstrates the potential of transfer learning in enhancing sports performance analysis. By leveraging existing models, we achieved high accuracy and efficiency, providing valuable insights for athletes and coaches. The VGG16 model, with its superior performance, was selected as the final model, showcasing the power of transfer learning in real-world applications.

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THANK YOU

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