

Investigating the Viability of Ultra-Low Parameter Count Networks for Real-Time Football Detection

Authors : Tim Farrelly

Abstract : In recent years, AI-powered object detection systems have opened the doors for innovative new applications and products, especially those operating in the real world or 'on edge' - namely, in sport. This paper investigates the viability of an ultra-low parameter convolutional neural network specially designed for the detection of footballs on 'on the edge' devices. The main contribution of this paper is the exploration of integrating new design features (depth-wise separable convolutional blocks and squeezed and excitation modules) into an ultra-low parameter network and demonstrating subsequent improvements in performance. The results show that tracking the ball from Full HD images with negligibly high accuracy is possible in real-time.

Keywords : deep learning, object detection, machine vision applications, sport, network design

Conference Title : ICCV 2022 : International Conference on Computer Vision

Conference Location : Istanbul, Türkiye

Conference Dates : January 28-29, 2022