Predicting Shot Making in Basketball Learnt Fromadversarial Multiagent Trajectories

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Abstract : In this paper, we predict the likelihood of a player making a shot in basketball from multiagent trajectories. Previous approaches to similar problems center on hand-crafting features to capture domain-specific knowledge. Although intuitive, recent work in deep learning has shown, this approach is prone to missing important predictive features. To circumvent this issue, we present a convolutional neural network (CNN) approach where we initially represent the multiagent behavior as an image. To encode the adversarial nature of basketball, we use a multichannel image which we then feed into a CNN. Additionally, to capture the temporal aspect of the trajectories, we use "fading." We find that this approach is superior to a traditional FFN model. By using gradient ascent, we were able to discover what the CNN filters look for during training. Last, we find that a combined FFN+CNN is the best performing network with an error rate of 39%.

Keywords : basketball, computer vision, image processing, convolutional neural network
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