Title: Convolutional neural networks and their application in object detection
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Abstract: Nowadays, it has become popular to enhance live sport streams with an augmented reality like adding various statistics over the hockey players. To do so, players must be automatically detected first. This thesis deals with such a challenging task. Our aim is to deliver not only a sufficient accuracy but also a speed because we should be able to make the detection in real time. We use one of the newer model of neural network which is a convolutional network. This model is suitable for processing image data a can use input image without any preprocessing whatsoever. After our detailed analysis we choose this model as a detector for hockey players. We have tested several different architectures of the networks which we then compared and choose the one which is not only accurate but also fast enough. We have also tested the robustness of the network with noisy patterns. Finally we assigned detected players to their corresponding teams utilizing K-mean algorithm using the information about their jersey color.

Keywords: convolutional neural networks, object detection, hockey, players