SELF-SUPERVISED LEARNING IMAGE RECOGNITION USING DEEP LEARNING

Artificial intelligence has existed under different names since the 60s computer vision and image recognition. Computer vision is the art and science of making computers understand images, brain is indeed a beautiful machine. From one single picture, it can retrieve more information. Humans can easily distinguish between places, objects, and people based on images, but computers have traditionally had difficulties with understanding these images. From time to time, you can hear terms like “Computer Vision” and or “Image Recognition”. Computer vision is a wide area in which deep learning is used to perform tasks such as image processing, image classification, object detection, object segmentation, image coloring, image reconstruction, and image synthesis. In computer vision, computers or machines are created to reach a high level of understanding from input digital images or video to automate tasks that the human visual system can perform. Whereas, image recognition is a field of computer vision that interprets images to aid decision-making. Image recognition is the final stage of image processing, which is one of the most important tasks of computer vision. Deep learning has brought significant developments in image understanding tasks such as object detection, image classification, and image segmentation. Self-supervised learning is a form of unsupervised learning that allows the network to learn rich visual features that help in performing downstream computer vision tasks such as image classification, object detection, and image segmentation. This paper provides a thorough review of self-supervised learning which has the potential to revolutionize the computer vision field using unlabeled data. First, the motivation of self-supervised learning is discussed, and other annotation efficient learning schemes. Various handcrafted pretext tasks are explained that enable learning of visual features using unlabeled image dataset. The paper also highlights the recent breakthroughs in self-supervised learning using contrastive learning and clustering methods that are outperforming supervised learning.

Keywords

Deep learning, self-supervised learning, Artificial intelligence.