Deep learning classification of rheumatoid arthritis

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September 26, 2017

Abstract

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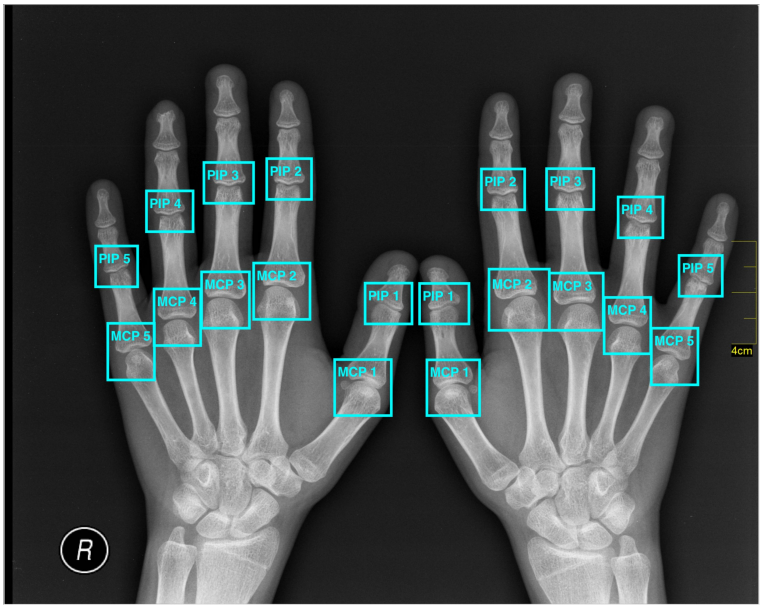

Figure 1: Proximal interphalangeal joints (PIP) and carpometacarpal joints (MCP).

Image by Nevit Dilmen (CC BY-SA) `https://commons.wikimedia.org/wiki/File:Medical\_X\-Ray\_imaging\_OPC06\_nevit.jpg`

1 Introduction

1.1 Rheumatoid arthritis

Rheumatoid arthritis is caused by a malfunctioning immune system. The immune attacks healthy tissue instead of bacteria and viruses. This causes inflammation in the joints. Irreversible damage to the joint can occur, if the inflammation lasts for a long time. [2]

1.2 Convolutional neural networks

Convolutional neural networks take an image as an input. The image then gets passed through several convolutional layers. These layers work as filters and detect different features in the image. The weights of these layers are combined to class scores. Andrey Karpathy provides a good overview over convolutional neural networks in his course notes for the Stanford class CS231n. [1]

References

References

[1] Stanford University Andrej Karpathy. *CS231n Convolutional Neural Networks for Visual Recognition*. [Online; accessed 26-September-2017]. URL: http://cs231n.github.io/convolutional-networks/.

[2] American College of Rheumatology. *Rheumatoid Arthritis*. [Online; accessed 26-September-2017]. URL: https://www.rheumatology.org/I-Am-A/Patient-Caregiver/Diseases-Conditions/Rheumatoid-Arthritis.

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