

Rheumatoid Arthritis Prediction Using Autoimmune Markers

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Abstract

Arthritis is a widespread musculoskeletal condition that affects thousands of individuals, especially Osteoarthritis (OA) & Rheumatoid Arthritis (RA) being the most frequent kinds. Early symptoms include stiffness, pain, and swelling, which can lead to serious immobility if not treated. Furthermore, new discoveries in medicine have produced a range of treatment alternatives, such as drugs, rehabilitation, and in extreme situations, surgery, giving people with arthritis the prospect of improved control and symptom relief. Since osteoarthritis cannot be cured, appropriate medical care and diagnosis can help manage disease for the long term. This paper examines deep learning model like DenseNet-201, ResNet-50, Xception & VGG-19 used for prediction of arthritis like OA & RA, with an emphasis on X-ray imaging & magnetic resonance imaging (MRI) as inputs for assessing OA and RA. The research proposes a more accurate method for early identification of Osteoarthritis (OA) using deep learning and transfer learning models based on Densely Connected Convolutional Networks-201 (DenseNet 201), Visual Geometry Group-19 (VGG-19), Residual Neural Network-50 (ResNet-50) and Xtreme Inception (Xception) from X-ray images. Upon conducting our analysis, we found that every recommended model was more predictively accurate (more than 80%) at identifying osteoarthritis. Nevertheless, with an 89% training accuracy and an 88% testing accuracy, its pretrained Xception model outperformed the others.

Keywords

Arthritis, Deep Learning, Osteoarthritis (OA), Rheumatoid Arthritis (RA), DenseNet-201, ResNet-50, Xception, VGG-19