

## **Deep learning based classification of wrist cracks from X-ray imaging**

### **ABSTRACT**

Wrist cracks are the most common sort of cracks with an excessive occurrence rate. For the routine detection of wrist cracks, conventional radiography (X-ray medical imaging) is used but periodically issues are presented by crack depiction. Wrist cracks often appear in the human arbitrary bone due to accidental injuries such as slipping. Indeed, many hospitals lack experienced clinicians to diagnose wrist cracks. Therefore, an automated system is required to reduce the burden on clinicians and identify cracks. In this study, we have designed a novel residual network-based convolutional neural network (CNN) for the crack detection of the wrist. For the classification of wrist cracks medical imaging, the diagnostics accuracy of the RN-21CNN model is compared with four well-known transfer learning (TL) models such as Inception V3, Vgg16, ResNet-50, and Vgg19, to assist the medical imaging technologist in identifying the cracks that occur due to wrist fractures. The RN-21CNN model achieved an accuracy of 0.97 which is much better than its competitor`s approaches. The results reveal that implementing a correct generalization that a computer-aided recognition system precisely designed for the assistance of clinician would limit the number of incorrect diagnoses and also saves a lot of time.