

Bone crack detector based on X-Ray using Fuzzy Logic and Neural Network

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Abstract

Large numbers of X-Ray images are analyzed by doctors in the hospitals day today. Based on that images doctors are going to predict what the problem in that bone is such as bone crack, damage etc. These kinds of manual inspection of X-Ray consume a lot of time and the process itself is monotonous made during the inspection.

The fractures of the bones will only occur during serious incident. This study discusses the development of a system which can differentiate the fractured bone from the non-fractured bone. The images of X-Ray differ in same bone also in different angle. The grown person the shape of the image of the bone is same from person to person. Also the shapes of the bones are same in healthy persons. Shapes of the bones are same in the grown person and baby. The continuous bones image is healthy one and fractures are classified first into three group which are Simple, Wedge and Complex. This study will focus on part of bone in the skeleton in our human body fracture detection.

Basic Image processing Techniques, Fuzzy Logic and Neural Network were used to implement the system. System accepts the image and detects the crack of the long bone. This system is detecting the crack of femur bone and fingers.

Image processing use to extract the bone from image, fuzzy logic use to detect crack of image from the features of bone and Neural Network verify that bone contains crack or not. System was implemented using C#.net programming language with the support of emguCV(C# wrapper for OpenCV) and Aforge.net. All those libraries and Graphical user interface were integrated and form a single complete system that performed the process.

Separate the rough lines from the smooth lines to detect the crack of the image. This research showed that the Fuzzy logic with Digital Image Processing techniques, able to identify the crack of the bone using X Ray image with acceptable accuracy level.