

## ABSTRACT

*The density of human bones is very important because bones function as a support for the body. If the bone is porous, even minor collisions can cause fractures. Bone loss can occur to everyone and also cannot be known by patients because there are no specific symptoms caused. Because of that, detection needs to be done so that bone loss can be treated immediately before it becomes fatal.*

*In this Final Project, a system that can classify normal bone and osteoporosis bone has been designed. The data used is the result of x-ray on normal bone and osteoporosis bone in the backbone, which will be processed with digital images. Data will be divided into 2 groups, namely training data, and test data. This system uses the Gray Level Co-occurrence Matrix (GLCM) method to extract features from data that has been processed with digital images and then Support Vector Machine (SVM) will be used to classify data.*

*The results obtained from this final project are a system simulation that can classify bone density into two types of bones, namely normal bone and osteoporosis bone. This system has an accuracy of 83,333% when the otsu threshold multiplied by the value 0.97, binary open area with a value of 60 or 70, dilated using a disk with a radius of 3, the angle of direction of GLCM  $0^\circ$ , neighboring pixel distances of 1 or 2, a combination of statistical features of GLCM (contrast, correlation, energy, and homogeneity) or (energy and homogeneity) and the kernel used in SVM is gaussian.*

**Keywords :** *Bone Density, Digital Image, Gray Level Co-occurrence Matrix, Support Vector Machine.*