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**MEASURING DAMAGES AND COLOUR REGIONS
IN TREE LEAVES
USING
IMAGE PROCESSING TECHNIQUES**

A PROJECT REPORT PRESENTED BY

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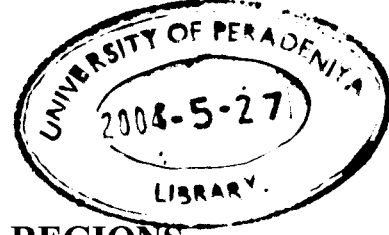
to the Board of Study in Statistics and Computer Science of the
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for the award of the degree of*

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**MEASURING DAMAGES AND COLOUR REGIONS
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Quantifying shape, colour and size of animal and plant materials is a key issue in many widely used biological studies. Researching for phytopathogenes, estimates of leaf area, measurement of fruit ripeness, and measurement of insect damages on crops are several examples where visual examination of the object is required. Some of these applications require staining and special lighting to make the parameters visible to the human eye.

At present, a large amount of studies are carried out by visual examination of the object concerned which is invariably influenced by the personal judgment of colour and shape. A limited number of instruments developed for leaf area estimation are in use, but its wide-spread use is hindered by the high cost involved. Besides, the facilities available in such a equipment are limited to a particular application.

The software developed in this project is used to determine the amount of damages, area of colour patches and patches due to diseases or elemental deficiency exhibited by leaves. With this, areas of leaves with damages and specified colour ranges were measured using digital image processing techniques. Also, the developed system could be used to measure the percentage ground covered by trees and branches overland using digital images taken upwards under canopy.

The image range may vary between 1 x 1 cm and 21 x 29 cm. Applying the same analysis scheme to images obtained through a microscope is also possible.

If detected regions are not in a satisfactory level, it is allowed to reanalyze with new colour range parameters, until it comes to a satisfactory level.