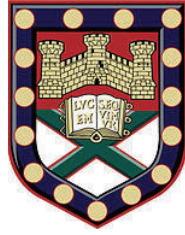


# Shape Descriptors



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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

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Mehmet Ali Aktas

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# Abstract

Every day we recognize a numerous objects and human brain can recognize objects under many conditions. The way in which humans are able to identify an object is remarkably fast even in different size, colours or other factors. Computers or robots need computational tools to identify objects. Shape descriptors are one of the tools commonly used in image processing applications. Shape descriptors are regarded as mathematical functions employed for investigating image shape information. Various shape descriptors have been studied in the literature. The aim of this thesis is to develop new shape descriptors which provides a reasonable alternative to the existing methods or modified to improve them.

Generally speaking shape descriptors can be categorized into various taxonomies based on the information they use to compute their measures. However, some descriptors may use a combination of boundary and interior points to compute their measures. A new shape descriptor, which uses both region and contour information, called centeredness measure has been defined. A new alternative ellipticity measure and sensitive family ellipticity measures are introduced. Lastly familiy of ellipticity measures, which can distinguish between ellipses whose ratio between the length of the major and minor axis differs, have been presented. These measures can be combined and applied in different image processing applications such as image retrieval and classification. This simple basis is demonstrated through several examples.



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