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The field of image processing includes any action on an image that can be performed by a computer, including analysis, manipulation, filtering, and the like. While there are many applications uses of image processing, one application in particular is in the field of object recognition, in which the computer itself can determine and identify a feature or set of features in an image, for example a face or a vehicle. There are many methods by which this can be performed. The keywords used in researching information were a combination of image processing and object recognition.

Facial recognition is one application of image processing and object recognition. A method of recognizing a single face out of a group of people using genetic algorithms was demonstrated by Swets, Punch, and Weng [1]. Their approach involves segmenting the image into blocks and comparing the subimage with a set of trained images using a genetic algorithm. Much research continues however, as there is much difficulty in dealing with variations in an image, such as changes in position, illumination, distortion, and other effects which can result in a suboptimal image for recognition and extraction [2]. While the research of both of these papers utilizes genetic algorithms, there are many other methods that can be used. [3] describes several other approaches to feature recognition, including fuzzy methods such as expert systems and neural nets [3, 7].

Even though there are several documented ways to perform object recognition, sometimes special algorithms and methods must be developed for a particular application and particular imagery. For example, object recognition from synthetic aperture radar is complicated by objects with certain features, like turret on a tank, objects that can have several variations of a basic type, and objects that can be partially hidden, and yet a method of recognition has been developed to handle the specific case [4].

The natural progression from these applications of object recognition in images is to matching 3-D models. One of the major difficulties however is dealing with overlaps in the multiple images that are required to create a 3-D view of an object [5]. Beyond these difficulties, traditional methods for segmenting an image do not apply as well to a 3-D model. [6] demonstrates a new methodology to handle this by which a 3-D shape is encoded into a 1-D geodesic distribution function, which overcomes limitations of existing shape distributions.

## Works Cited

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