



## Systems and Methods for Recognizing Objects in an Image

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel system for identifying objects with salient boundaries, such as fish or airplanes.**

### Overview

Object recognition, which is important in systems that inspect or authenticate, is complicated because objects typically have shapes that vary, depending on the angle from which they are viewed. Previous algorithms could not be easily and accurately used to determine what parameters are invariant as an object moves, and alternatives, such as storing several views of each item or computationally deriving such views, have not been practical.

### The Invention

UW-Madison researchers have developed a novel summation invariant recognition system for identifying objects with salient boundaries, such as fish or airplanes. This system represents the shape of an object as a set of discrete points and uses these points to create a summation invariant, which does not change under various viewing conditions.

To identify an object in an image, a contour of the object is extracted and normalized. Then one or more summation invariants are determined and compared to summation invariants for the target object(s). To distinguish between similar objects, the algorithm also can be performed locally to extract features of the contour and determine semi-local summation invariants. If the summation invariants match, the extracted object is recognized as the target object.

### Applications

- Identifying images of many complex objects

### Key Benefits

- Invariants are less sensitive to quantization error, which is inevitable in digital images, than differential or wavelet-based invariants that have been used in the past.
- Improved ability to discriminate between similar objects

### Stage of Development

This method was applied successfully in a 2-D database of fish.

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#### For More Information About the Inventors

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#### Tech Fields

- [Information Technology : Image processing](#)

For current licensing status, please contact Jeanine Burmania at [jeanine@warf.org](mailto:jeanine@warf.org) or 608-960-9846

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