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**Description**

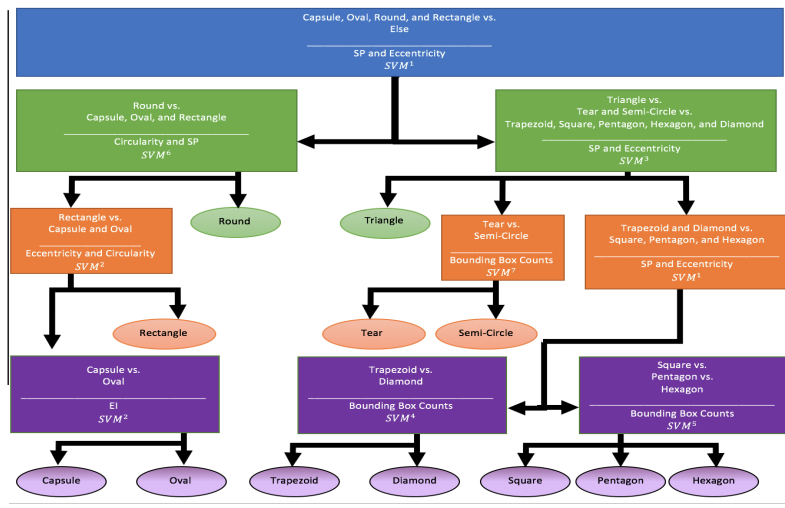
We have designed a Human Machine Hybrid (HMH) pill shape classification system comprising of: 1) An imaging device for generating pill images; 2) A computer system receiving and processing the pill images; 3) A decision tree providing algorithm for uniquely identifying pill shape; and 4) An output device providing a user with shape classification of the pill. Our decision tree uses neural network algorithm to process pill images, and extracts pill descriptors by using human knowledge. The computer modeling techniques are used to discriminate descriptors for proper pill identification.

**Problem Addressed**

Prescription drug use is on the rise all over the world. Many a times patients are given the wrong medication due to poor communication between health care officials. A method to identify pills automatically is desirable by law enforcement agencies, the health care industry, and consumers. The ubiquity of smart phones and affordable, high-quality cameras allows for users to take pictures of pills effortlessly. This allows for pills to be potentially identified by both medical professionals and consumers. Nurses and medical technicians would be able to verify the administration of pills to patients. However, pill identification remains a challenging problem. Our invention implements a Human-Machine Hybrid (HMH) decision tree with a total of seven interpretable metrics, that classifies pills based on shape, color and size. This model outperforms all other existing approaches to pill identification.

**Advantages**

- The computer system compares a shape of an identified pill with a shape of a reference pill in a database and, if the identified pill differs greatly from a reference pill in the database, then indicates to the user that the identified pill is a fake pill.



**Figure One:** Pill classification based on shapes, color and size.

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