

# Features

Features are basically properties/characteristics of an entity or a phenomenon. They give us more specific information that might help us describe the target object better and as a set helps us to identify a unique object. Mostly in ML we represent features as numerical values using some metric or encoding. Each object is represented by a feature vector of length  $n$  and it's called  $n$  dimensional feature vector. We try to extract these features so that they define and help to identify the object efficiently.

## Iris as a good biometric

Iris is currently recognised as the most efficient and precise biometric there is for recognition and identification. Iris contains characteristics and patterns that are unique to each person. Even the same person's left and right iris is different in themselves and also even twins can be differentiated using iris. And it is well protected so it won't be damaged and it doesn't change over time unlike fingerprints which can wear off.

## Features of Iris

Iris is different in many ways and a lot of features can be defined upon it. Firstly we can define some features based on pupil such as *pupil roundness*, *pupil largeness* and *pupil smoothness*. And based on collarette area we can have similar features like *collarette roundness*, *collarette iris ratio* and *collarette pupil ratio*. In the lines of Iris we can have Iris roundness and Iris diameter specific features. These are all more or less the geometrical features we can define on an iris.

There's a lot more detailing in an iris to ponder upon for features like it's rich texture information such as

**patterns, rifts, colours, rings, spots, stripes, filaments, coronal, furrows, minutiae and recess** and other detailed characteristics.

And iris is also very well suited for texture based feature extraction. The surface of iris contains very complex texture structures such as **crystals, thin threads, spots, concaves, radials, furrows, stripes** and so.

