In this thesis we focus on partially occluded object recognition under geometric transformations. Objects are represented by their contours. Depending on the kind of geometric transformation and robustness to occlusion we introduce different solutions. Our results are applicable in industry, robotics, 3D vision, forensics, etc. We propose three novel methods for partially occluded object recognition. The major contribution of all our methods is a creation of features. Features are designed to be local and invariant to appropriate geometric transformations. We use mostly standard feature matching to prove properties of designed features. The first method deals only with translation, rotation and scaling (Euclidian transformation) and is based on contour approximation by circle arcs. The parameters of the circle arcs seem to be suitable features. The second method deals with affine transformation and is based on polygonal approximation of contours and, moreover, is robust to additive noise. The second method splits the contour into parts using inflexion points and transforms every part into both normalized shape and position. The parameters of standard shapes of every part are the desired features. The third method deals also with affine transformation. It splits the object into parts using a novel, cutting algorithm. This method employs moment based affine invariants of these parts as features. All methods are simple and easy to implement. We demonstrate the properties of the proposed methods on synthetic, manually drawn data, where the geometrical transformation, occlusion, additive noise and noise in inflexion points detection were simulated. Foreover, the second method was tested on real-word data as well.