## Rotation invariant moments[[edit](http://en.wikipedia.org/w/index.php?title=Image_moment&action=edit&section=6" \o "Edit section: Rotation invariant moments)]

It is possible to calculate moments which are [invariant](http://en.wikipedia.org/wiki/Invariant_(mathematics)) under [translation](http://en.wikipedia.org/wiki/Translation_(geometry)), changes in [scale](http://en.wikipedia.org/wiki/Scale_(ratio)), and also [*rotation*](http://en.wikipedia.org/wiki/Rotation). Most frequently used are the Hu set of invariant moments:[[1]](http://en.wikipedia.org/wiki/Image_moment#cite_note-.E2.80.9Chu-1)[[2]](http://en.wikipedia.org/wiki/Image_moment#cite_note-2)

   I_1 = \eta_{20} + \eta_{02}


   I_2 = (\eta_{20} - \eta_{02})^2 + 4\eta_{11}^2


   I_3 = (\eta_{30} - 3\eta_{12})^2 + (3\eta_{21} - \eta_{03})^2


   I_4 = (\eta_{30} + \eta_{12})^2 + (\eta_{21} + \eta_{03})^2


   I_5 = (\eta_{30} - 3\eta_{12}) (\eta_{30} + \eta_{12})[ (\eta_{30} + \eta_{12})^2 - 3 (\eta_{21} + \eta_{03})^2] + (3 \eta_{21} - \eta_{03}) (\eta_{21} + \eta_{03})[ 3(\eta_{30} + \eta_{12})^2 -  (\eta_{21} + \eta_{03})^2]


   I_6 =  (\eta_{20} - \eta_{02})[(\eta_{30} + \eta_{12})^2 - (\eta_{21} + \eta_{03})^2] + 4\eta_{11}(\eta_{30} + \eta_{12})(\eta_{21} + \eta_{03})


   I_7 = (3 \eta_{21} - \eta_{03})(\eta_{30} + \eta_{12})[(\eta_{30} + \eta_{12})^2 - 3(\eta_{21} + \eta_{03})^2] - (\eta_{30} - 3\eta_{12})(\eta_{21} + \eta_{03})[3(\eta_{30} + \eta_{12})^2 - (\eta_{21} + \eta_{03})^2].
