

#### 14.2.4 computing the negative image

In film-based photography a negative image was obtained when the film was developed, and then a positive image was created from the negative. We can easily simulate this and compute a negative digital image.

Suppose we have a grey-level image  $P = (p_{ij})_{j=1}^{m,n}$  with intensity values in the interval  $[0, 1]$ . Here intensity value 0 corresponds to black and one corresponds to white. To obtain the negative image we just have to replace an intensity  $p$  by its mirror value  $1-p$ .

#### 14.2.5 Increasing contrast

A common problem with images is that the contrast often is not good enough. This typically means that a large proportion of the grey values are concentrated in a rather small subinterval of  $[0, 1]$ . The obvious solution to this problem is to

spread out values. This can be accomplished by applying a function  $f$  to the intensity values i.e. new intensity values are computed by the formula

$$p_{ij} = f(p_{ij})$$

for  $i$  and  $j$ . If we choose  $f$  so that its derivative is large in the area where many intensity values are concentrated, we obtain the desired.