Spatially Varying Blurring

Circular disk filter with varying radii (r) is used to blur the background of the image with below criteria on the radii.

Let dp be the smallest distance between background pixel 'p' and the foreground image and alpha be the tuning parameter.

    if (dp <= alpha)
            then r = dp
    else
            r = alpha

This is how we get the radii of the disk filter for the pixel 'p'. The above criteria ensure that the foreground image pixels don't take part in the blurring process of background pixels.

Fig 1, shows the disk filter for various radii; the 1st row has alpha = 40 and 2nd row has alpha = 20.
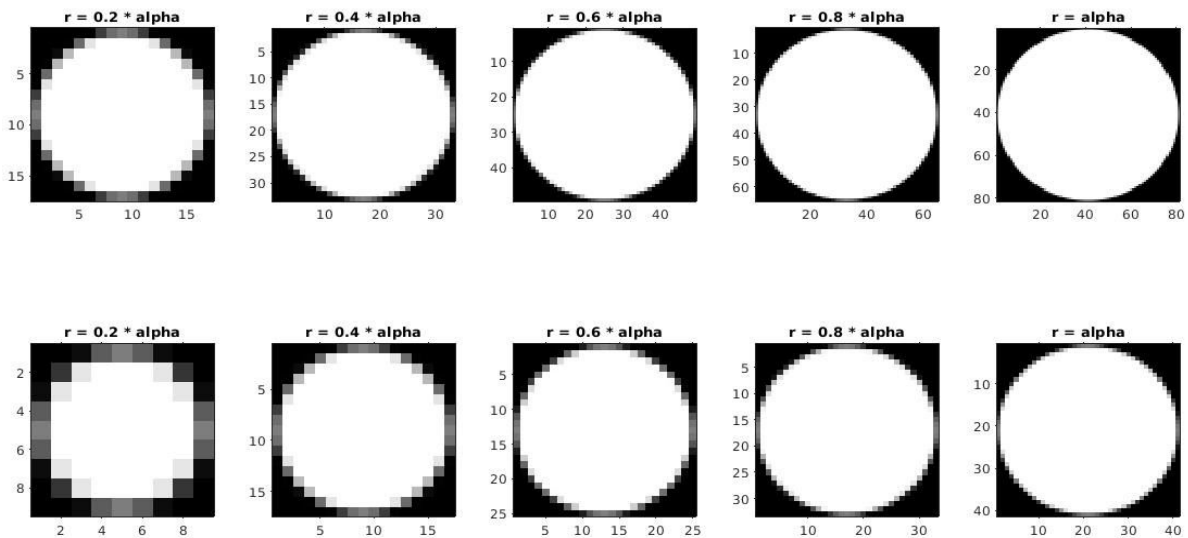

Fig 1: Disk kernel with varying radii

Fig 2 depicts the use of Spatially Varying Disk Kernel for blurring the background of the image.
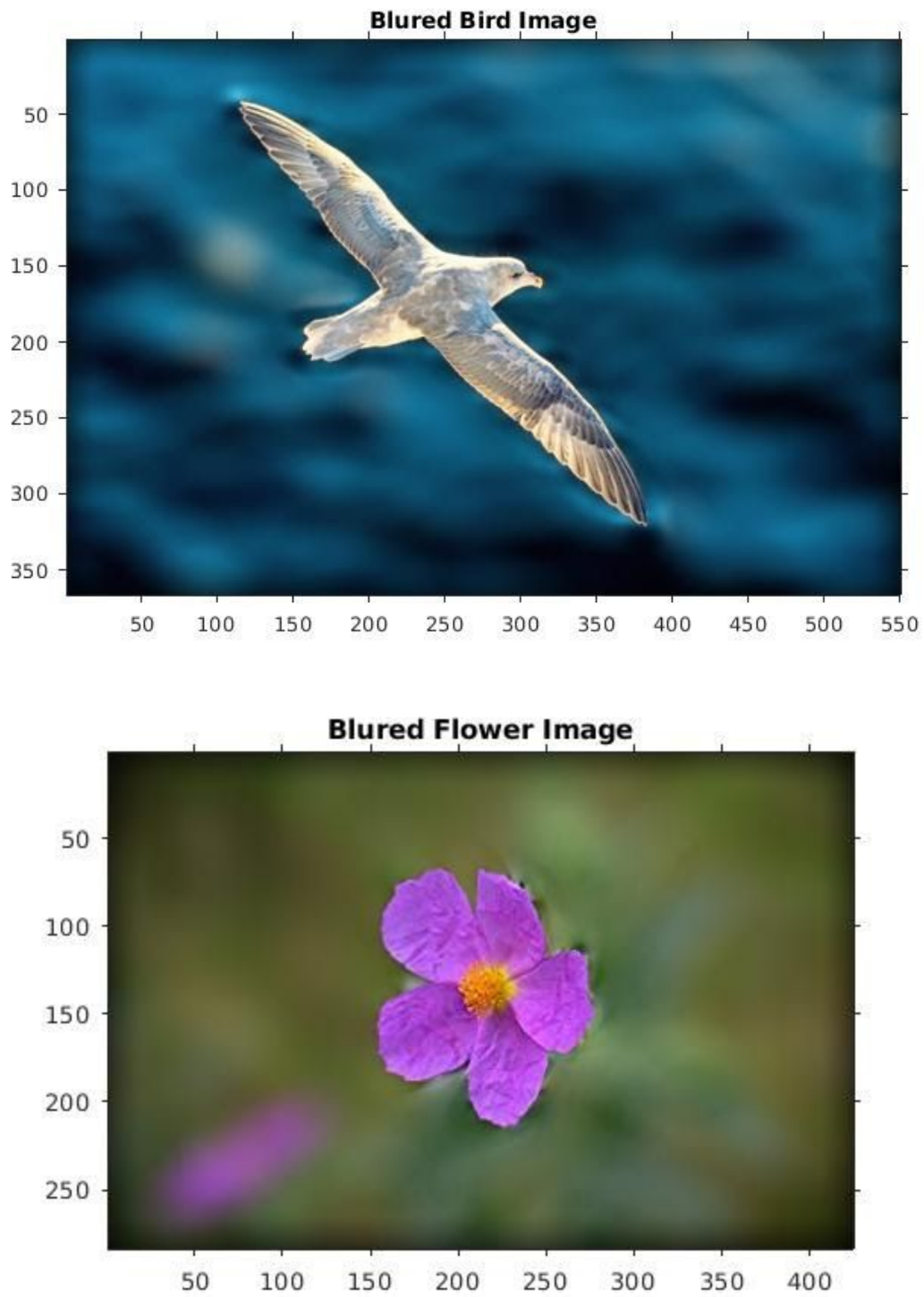

Fig 2: Blurred images using Spatially Varying Blurring Technique

Fig 3 shows the variation of radii used by the background pixels of the image across the image. The position away for the foreground shows consistency as over there the radii is equal to alpha, but as we move near the foreground there is a variation as the radii gets set to the dp (shortest distance from the foreground).
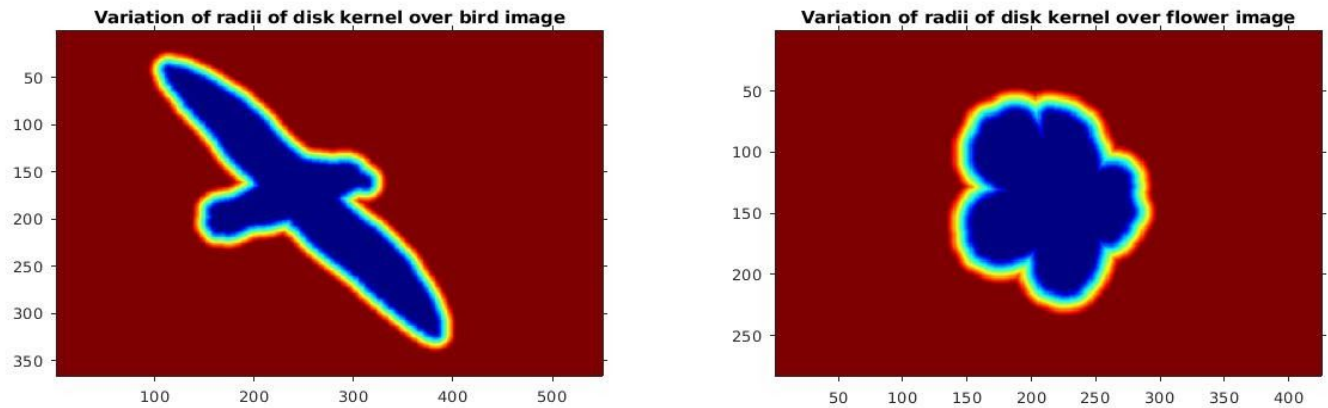

Fig 3: Variation of radii across the image