

Please hand in this paper to the instructor before the end of the lecture.

Lastname (PRINT): _____	Firstname: _____
Student number: _____	Date: _____

Q. A Gaussian filter weights a neighbour by how far away it is. The bilateral filter adds a second weight. Write down what that second weight depends on, and say in one sentence why this makes the filter *edge preserving*.

Q. Consider the following 1D signal, which contains a step edge:

10 12 11 10 60 62 61 60

We filter the pixel with value 60 (the first after the edge), using a spatial window of three pixels either side and a small range parameter $\sigma_r = 5$. Which neighbours contribute meaningfully, and which are suppressed? No arithmetic required.

Q. What happens to the bilateral filter as $\sigma_r \rightarrow \infty$? Name the filter you are left with.

Q. The bilateral filter is not a convolution. Explain briefly which property of convolution it violates.