# Spectral Graph Theory and High Performance Computing
# Eigenvalue theory

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## 1 Theory

The filter $W$ is built on top of the kernel matrix $K$ measuring the similarity between each pixel. The most popular kernel functions are the *Bilateral filter* [1] and the *Non-local Mean filter* [2]. Both of those create a symmetric positive semi-definite matrix such as $k_{ij} \geq 0$.

# References


[1] C. Tomasi and R. Manduchi. "Bilateral filtering for gray and color images". In: *Sixth International Conference on Computer Vision (IEEE Cat. No.98CH36271)*. Jan. 1998, pp. 839–846. DOI: 10.1109/ICCV.1998.710815.

[2] C. Kervrann and J. Boulanger. "Optimal Spatial Adaptation for Patch-Based Image Denoising". In: *IEEE Transactions on Image Processing* 15.10 (Oct. 2006), pp. 2866–2878. ISSN: 1057-7149. DOI: 10.1109/TIP.2006.877529.