

# Multiple Multiresolution Analysis for Image Compression

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We present a technique for compressing images based on their multiple multiresolution decomposition. As an extension of standard wavelet and wavelet-like approaches, in a multiple multiresolution analysis data are processed with a tree of filterbanks consisting of filters and decimation matrices that can vary depending on the level. Our algorithm takes advantage of the redundancy in the transformed image by employing an efficient selection strategy of the portion of coefficients to be kept while still retaining most of the energy of the data. Furthermore, our method is able to capture the peculiar anisotropic information of the image while maintaining a low implementation complexity thanks to an efficient filterbank implementation and to the possibility of expressing the employed 2-D filters in an almost separable aspect [1, 2].

**Joint work with:** Dörte Rüdeler and Tomas Sauer (Universität Passau, Germany).

## References

- [1] M. Cotronei, M. Rossini, T. Sauer, and E. Volontè. Filters for anisotropic wavelet decompositions. *J. Comput. Appl. Math.*, 349:316–330, 2019.
- [2] M. Cotronei, D. Rüdeler, and T. Sauer. Multiple filterbanks for image processing: Implementation issues. *Math. Comput. Simul.*, 176:147 – 159, 2020.