

CLASSIFICATION OF EDGES USING COMPACTLY SUPPORTED SHEARLETS

PHILIPP PETERSEN

It is a rather well known fact, that the wavelet transform is an effective tool to detect pointwise singularities. For curve-like singularities it turned out, that a directional approach is necessary, which leads to the development of directed systems. One particular systems is the so-called shearlet system, which has been shown to enable a precise geometric description of the singularities of multidimensional functions. Not only does the asymptotic behavior of the shearlet transform determine the position and orientation of singularities, it can also be utilized to classify such edges. In particular, given a characteristic function with a piecewise smooth edge we can detect and classify its singularity curve as well as the non-smooth points on the curve.

However, these results have only been established for band-limited shearlet transforms. Band-limited shearlets lack the spatial localization that compactly supported shearlets can provide. Therefore it seems promising to examine the edge classification in the context of compactly supported shearlets. Indeed, we will establish that with compactly supported shearlets the classical results can be improved.