Multi-scale detection of higher order geometric features using Taylorlets

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In various fields of image analysis, determining the precise geometry of occurent edges, e. g. the contour of an object, is a crucial task. Especially the curvature of an edge is of great practical relevance. In this talk, we introduce an extension of the continuous shearlet transform which additionally utilizes shears of higher order. This extension, called the Taylorlet transform, allows for a detection of the position and orientation, as well as the curvature of object boundaries in 2D and 3D. Furthermore, we introduce novel vanishing moment conditions of the form $\int_{\mathbb{R}} g(\pm t^k) t^m \, dt = 0$. We will show that Taylorlets fulfilling such conditions enable a more robust detection of the geometric features.