

A Comparison of 2D Regular Grids based on Digital Continuity of Rotations

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Abstract. A digitized rigid motion is called digitally continuous if two neighbor pixels still stay neighbors after the motion. In this talk digital rotations of a pixel with its closest neighbors are of our interest. We compare the neighborhood motion map results among the three regular grids, when the center of rotation is the midpoint of a main pixel, a grid point (corner of a pixel) or an edge midpoint. The first measure about the quality of digital rotations is based on bijectivity. Now, a second measure is investigated, the quality of bijective digital rotations is measured by the digital continuity of the resulted image. We show that triangular grid proves to be digitally continuous at many more integer angles compared to the square grid or the hexagonal grid with respect to the three different rotation centers.

Keywords: Digital geometry • Digital image processing • Combinatorial image processing • Discretized rotations • Discrete motions • Non-traditional grids • Neighborhood motion maps • Digital continuity