

2D FFT with Simultaneous Edge Artifact Removal

Applications

- High speed industrial tracking
- Medical diagnostics (MRI, CT, etc.)
- Electron microscopy
- Astronomical imaging
- Image processing (convolution)

Problem & Solution

2D Fast Fourier Transforms (FFTs) become a computational constraint for real-time/near real-time systems. FFTs inherently assume that image edges are periodic leading to high amplitude “cross-shaped” artifacts in the frequency domain. These artifacts can be propagated to later stages of processing, adversely affecting decision critical applications, such as, medical diagnostics.

This technology simultaneously removes edge artifacts by decomposing the image into periodic and smooth components in real-time.

Benefits

- Real-time processing
- Minimization of artifacts
- 100 fps for 2048 x 2048 pixel image

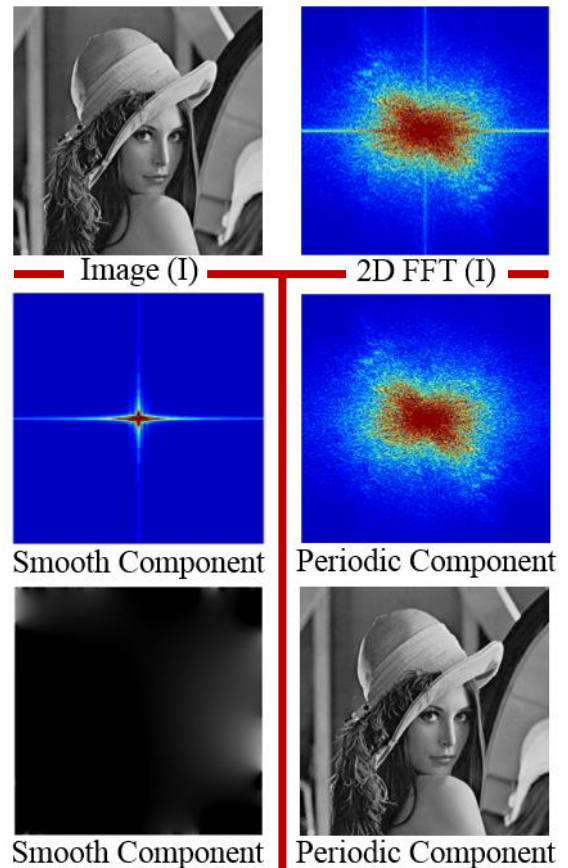
Patent Pending

Keywords

Fourier transform, FFT, High-throughput FFT, 2D FFT, image decomposition, FPGA based FFTs

For more information

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Series of images showing FFT processing and Simultaneous Edge Artifact Removal of this technology implemented on FPGA. The smooth component is the artifact and the periodic component has had the artifact removed using this technology.