



## A TIME-FREQUENCY BASED PERCEPTUAL AND ROBUST WATERMARKING SCHEME (ThuAmOR8)

★ Author(s) :

Mahmood

(Michigan Sate University, United States)

Al-Khassaweneh

Selin Aviyente

(Michigan Sate University, United States)

★ Abstract :

In the past decade, watermarking has become an important tool in copyright protection applications. In this paper, we introduce a new watermarking scheme in the joint time–frequency domain. Wigner distribution is used to transform an image into the spatial–spectral domain. The proposed method selects the time–frequency cells to be watermarked based on the particular image's energy distribution in the joint domain. This approach ensures the imperceptibility of the embedded watermark. It is shown that embedding in the time–frequency domain is equivalent to a nonlinear embedding function in the spatial domain. A corresponding watermark detection algorithm is also introduced. The performance of the proposed watermarking algorithm under possible attacks, such as noise, re–sampling, rotation, filtering, and JPEG compression is illustrated.

[Menu](#)