



Bi-dimensional multiscale entropy: Relation with discrete Fourier transform and biomedical application

Submitted by Anne Humeau-Heurtier on Fri, 06/22/2018 - 20:43

Titre	Bi-dimensional multiscale entropy: Relation with discrete Fourier transform and biomedical application
Type de publication	Article de revue
Auteur	Humeau-Heurtier, Anne [1], Omoto, Ana Carolina Mieko [2], Silva, Luiz EV [3]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	1er Sept. 2018
Pagination	36-40
Volume	100
Titre de la revue	Computers in Biology and Medicine
ISSN	0010-4825
Mots-clés	Discrete Fourier transform [4], Histological image [5], Image processing [6], multiscale entropy [7], Power spectrum [8], rat [9]
Résumé en anglais	<p>The multiscale entropy (MSE1D) measure is now widely used to quantify the complexity of time series. The development of complexity measures for images is also a long-standing goal. Recently, the bi-dimensional version of MSE1D has been proposed (MSE2D) to analyze images. The interpretation of MSE2D curves and the applications to real data are still emergent. Because the coarse-graining step in the MSE2D computation changes the frequency content of the image, we hypothesized a possible dependence between MSE2D and the discrete Fourier transform (DFT). To analyze this dependence, synthetic as well as biomedical images are analyzed. Our results reveal that i) the profile of MSE2D is sensitive to both the amplitude and phase of the DFT; ii) MSE2D could find applications in the biomedical field. This work brings valuable information for MSE2D interpretation and opens possibilities to study images from an entropy point of view through spatial scales.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua17139 [10]
DOI	10.1016/j.combiomed.2018.06.021 [11]
Lien vers le document	https://www.sciencedirect.com/science/article/pii/S0010482518301690 [12]

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Publié sur *Okina* (<http://okina.univ-angers.fr>)