



Fisher information and Shannon entropy for on-line detection of transient signal high-values in laser Doppler flowmetry signals of healthy subjects

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Résumé en anglais	<p>Laser Doppler flowmetry (LDF) is an easy-to-use method for the assessment of microcirculatory blood flow in tissues. However, LDF recordings very often present TRANSient Signal High-values (TRASH), generally of a few seconds. These TRASH can come from tissue motions, optical fibre movements, movements of the probe head relative to the tissue, etc. They often lead to difficulties in signal global interpretations. In order to test the possibility of detecting automatically these TRASH for their removal, we process noisy and noiseless LDF signals with two indices from information theory, namely Fisher information and Shannon entropy. For this purpose, LDF signals from 13 healthy subjects are recorded at rest, during vascular occlusion of 3 min, and during post-occlusive hyperaemia. Computation of Fisher information and Shannon entropy values shows that, when calibrated, these two indices can be complementary to detect TRASH and be insensitive to the rapid increases of blood flow induced by post-occlusive hyperaemia. Moreover, the real-time algorithm has the advantage of being easy to implement and does not require any frequency analysis. This study opens new fields of application for Fisher information and Shannon entropy: LDF 'denoising'.</p>
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- [3] [http://okina.univ-angers.fr/publications?f\[author\]=1901](http://okina.univ-angers.fr/publications?f[author]=1901)
- [4] <http://okina.univ-angers.fr/f.chapeau/publications>
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