



Asymptotic probability distribution of distances between local extrema of error terms of a moving average process

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Consider error terms $x(i)$ of a moving average process $MA(q)$, where $x(i) = e(i) + e(i-1) + \dots + e(i-q)$ and $e(i)$ - independent identically distributed (i.i.d.) random variables. We recognize a term $x(i)$ as a local maximum if the following condition holds true: $x(i-1) < x(i) > x(i+1)$. If the local maximum $x(i)$ is followed by the next local maximum $x(k)$, then $d = k - i$ is the distance between local maxima. The distances $d(j)$ themselves are random variables. In this paper we study the probability distribution of distances $d(j)$. Particularly, we show that for any $q > 0$ mean distance $E[d(j)] = 4$ and asymptotically the variance is also equal to 4.

Comments: Updated references, corrected equations, language edited. 4 pages

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