

## عنوان مقاله:

A New Method for Sperm Detection in Human Semen: Combination of Hypothesis Testing and Local Mapping of Wavelet Sub-Bands

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## خلاصه مقاله:

Introduction Automated methods for sperm characterization in microscopic videos have some limitations such as: low contrast of the video frames and possibility of neighboring sperms to touch each other. In this paper a new method is introduced for detection of sperms in microscopic videos. Materials and Methods In this work, first microscopic videos are captured from specimens of human semen. Several frames of these videos are transformed to wavelet sub-bands and bit-related planes are constructed from wavelet sub-bands separately. Finally, the acquired bit planes are mapped by different local mapping functions and decision is made using continuity and discontinuity of the mapping results. Based on the above decision procedure, each region of the microscopic image is assigned to either a sperm or other parts of semen. Results Performance of the proposed method was evaluated by two sets of microscopic videos which have been captured from semen of some infertile men. The first sets belonged to semen specimens with low densities of sperms and the second set belonged to semen specimens with high densities of sperms. Conclusion The results of this study revealed that the proposed method in this work is more efficient in sperm detection and extraction compared with the current approaches in both scenarios. Furthermore, it is evident that for specimens with higher sperm densities the proposed method improved sperm detection also reduces false detection rate considerably.

## کلمات کلیدی:

Detection, Hypothesis Testing, Mapping, Microscopic Video, Semen, Wavelet Sub-Bands

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