# Fast Tumor Extraction Method Based on Nl-Means Filter and Expectation Maximization

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**Abstract :** The development of science has allowed computer scientists to touch the medicine and bring aid to radiologists as we are presenting it in our article. Our work focuses on the detection and localization of tumors areas in the human brain; this will be a completely automatic without any human intervention. In front of the huge volume of MRI to be treated per day, the radiologist can spend hours and hours providing a tremendous effort. This burden has become less heavy with the automation of this step. In this article we present an automatic and effective tumor detection, this work consists of two steps: the first is the image filtering using the filter Nl-means, then applying the expectation maximization algorithm (EM) for retrieving the tumor mask from the brain MRI and extracting the tumor area using the mask obtained from the second step. To prove the effectiveness of this method multiple evaluation criteria will be used, so that we can compare our method to frequently extraction methods used in the literature.