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Abstract — **An intensity-based texture segmentation approach for the detection of regions with abnormal texture characteristics in magnetic resonance imaging is presented. Our algorithm is tested over several images taken from The Parkinson's Progression Markers Initiative (PPMI-database), and the results suggest that this approach is suitable for the successful identification and extraction of regions of interest whose properties can be potentially related to signature features of Parkinson disease.**

Keywords— intensity-based texture segmentation; Parkinson's disease; image processing.

I. INTRODUCTION

Just after Alzheimer's disease, Parkinson's disease (PD) is the most common neurodegenerative condition. PD represents a major threat to elder people. The diagnosis of the PD requires an accurate detection, which is performed by highly skilled specialists. Computer Aided Diagnosis (CAD) may help to detect the PD. Here we present and validate an improved diagnosis procedure of PD.

II. METHOD AND RESULTS

In Fig. 1, we show the block diagram of the proposed algorithm. Based on the fact that regions with abnormal brain activity are represented by zones in the image with dissimilar textural properties [1-3].
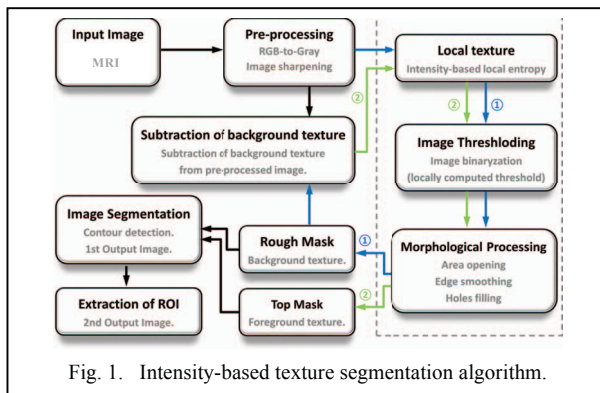

Fig. 1. Intensity-based texture segmentation algorithm.

Texture differences, encoded in transition regions, are identified using morphological analysis and, in this particular case, an entropy-based algorithm is preferred over a gradient-based one due to the several intensity changes that take place in a single transition region [2].

Fig. 2 shows some example of the original, segmented, and extracted images for two illustrative cases.
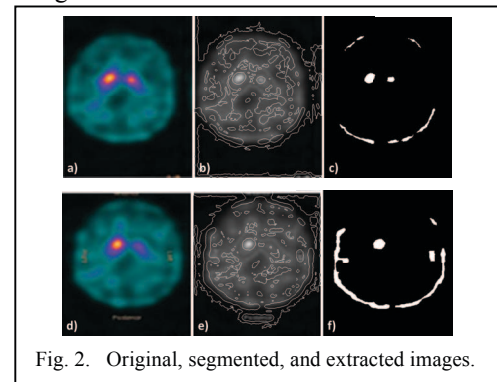

Fig. 2. Original, segmented, and extracted images.

CONCLUSION

The results show that the proposed CAD algorithm is a suitable tool for qualitative evaluation of digital MRI images as it allows for an effective identification and extraction of regions of interest. The properties of these regions of interest can be related to the characteristic signatures of PD for further classification and diagnosis.

ACKNOWLEDGMENTS

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