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## APPLICATION OF PYRADIOMICS AND 3D SLICER TO MEDICAL IMAGE ANALYSIS

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### ABSTRACT

This study assesses the application of 3D slicer and pyradiomics in biomedical imaging. This has tremendous but mostly unrealized potential in healthcare to support accurate interpretation of the clinical images. It has been observed that adequate information are not fully acquired from the clinical images due to big data and post-processing problems; therefore, it is important to develop methods of extracting full information from an image for medical purposes. As a clinical research tool, 3D Slicer is similar to a radiology workstation that supports versatile visualizations but also provides advanced functionality such as automated segmentation and registration for a variety of application domains. Radiomics also plays an important role in the assessment of tumor biology. Its main challenges is the acquisition and reconstruction of standardized images, lesion segmentation, feature extraction and quantitative data analyses. This study is aimed at generating methods of extracting reliable and robust information for medical analysis and aid easier and precise clinical incisions. In order to address this problem, a magnetic resonance image of brain tumor was obtained and segmented in two parts to differentiate a regular from an irregular brain cell. The result obtained from the segmentation shows the difference in skewness, energy, sphericity etc. Statistical analysis and data mining were then performed on the extracted data to demonstrate new image information using MaZda (© Technical University of Lodz, Institute of Electronics). The analysis could provide a tool for indicating clinical prognosis, molecular phenotype, pathological diagnosis and tumor genetic heterogeneity.

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