Abstract

Brain tumor being a deadly malignancy with low survival rate is the tenth leading cause of mortality and morbidity among men and women worldwide. Thus, the diagnosis of glioma tumor is extremely sensitive and complex task that needs to be detected timely and accurately in order to save a patient's life .Human assisted manual inspection may result in misdiagnosis when there is a large amount of data to be assisted. The work in this paper solves the problem by demonstrating the potential of using formal model-based approach in MR images with the aim to assist health care professionals for prompt diagnosis. In this paper, an efficient non-invasive method for prediction of glioma cancer grade and treatment of whether cancer is suitable for primary pharmacotherapy or not is proposed on the basis of pathologists and surgeons' suggestions. The method works by extracting radiomic features from Magnetic resonance images using Pyradiomics which are then presented in terms of formal models. A set of properties characterizing the tumor grades and treatment of tumor are generated. Formal verification environment is then used to verify these properties on real world dataset confirming the proposed method effectiveness.