



# COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

## MSc Defence

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### A Hybrid Unsupervised Classification Technique for Automatic Brain MRI Tumor Recognition

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#### **Abstract**

Cancer is a prevalent disease with a rising incidence worldwide. The most common misdiagnosed type of cancers are brain tumors. Patients in early stages of brain tumors often present with vague symptoms. Due to the ambiguous nature of symptoms, diagnosis is difficult and the delay in diagnosis leads to a poor prognosis. In MRI images, brain tumors are hard to classify since they are embedded near normal tissues. This makes it hard for doctors to exactly extract tumors. Recognition of tumors in MRI images is tedious and time-consuming in most cases. To assist this process, several machine learning techniques have been developed. However, the techniques have limitations in practical diagnosis: Supervised techniques need a human operator to choose training data, while unsupervised techniques can only segment images without recognizing tumors. In this thesis research, we developed a hybrid technique for automatic brain MRI tumor recognition. This technique may overcome some limitations of the existing techniques as it does not require the involvement of a human operator and can effectively recognize tumors.