

Support vector machine method for classifying severity of Alzheimer's based on hippocampus object using magnetic resonance imaging modalities

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Abstract	<p>Alzheimer's disease is a degenerative brain condition that causes progressive decline in several aspects. Starting from memory, cognitive or thinking abilities, speaking abilities, and behavior. Currently, Alzheimer's diagnosis uses some methods, such as blood tests, scanning with computerized tomography scan (CT scan), or magnetic resonance imaging (MRI). As a reference for determining the level of severity, doctors usually use clinical dementia rating (CDR). CDR is a numerical scale used to measure the severity of dementia symptoms. The doctor will manually compare the patient's condition with those stated on the CDR. This condition will take quite a long time, and sometimes human error will occur. As technology and science develop, doctors can assist in manually detecting Alzheimer's using classification algorithms. Many methods can be used to classify, including the CDR support vector machine (SVM) method. Unfortunately, this method is usually only used to classify two classes. This technology allows the classification process to be carried out automatically and quickly. On the other hand, when using CDR to classify Alzheimer's severity, there are several scales, not just two classes. So, in this research, we modified the use of SVM to classify three levels of severity, namely scale 0 for normal, scale 1 for mild conditions, and scale 2 for moderate conditions. The experiments we carried out provided an accuracy of 90.9%.</p>
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Author	Ir MUHAMMAD SYAIFUL ALIIM, S.T, M.T