1117-00-519   **Xin Yang*** (`yangxinncut@gmail.com`), 805 Bradyville Pike, G08, Murfreesboro, TN 37130, and **Qiang Wu** and **Don Hong**. *Spatial Regularization for Neural Network and Application in Alzheimer's Disease Classification.*

In the past 20 years, there are huge amount of researchers have studied the Alzheimer's Disease image data. Many high-dimensional classification methods use structural MRI brain image for classification between AD and healthy controls. Since the computer computation power has been improved, neural networks have been widely applied in disease diagnosis. However, the neural network does not consider the brain spatial information. This may lose some important information due to the ignore of the neighbor effect. Because the voxel of the 3D brain is not isolated, in reality some brain area has extremely close relationship. To overcome the shortage of spatial correlation problem, in this project, we proposed a new technique Spatial Regularization Neural Network, which incorporates spatial informa- tion provided by each voxel's 3 dimensional neighbor voxels. Real application results show satisfactory performance from Spatial Regularization Neural Network. (Received January 19, 2016)