

Appendix 1 to Lee S, Lee H, Kim KW; for the Alzheimer’s Disease Neuroimaging Initiative. Magnetic resonance imaging texture predicts progression to dementia due to Alzheimer disease earlier than hippocampal volume. *J Psychiatry Neurosci* 2019. DOI: 10.1503/jpn.180171

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Supplementary Table 1: Gray level co-occurrence texture features

Texture feature	Description	Reference
Energy	Measures local homogeneity and represents the opposite of Entropy. Images with a constant or periodic gray level distribution give high values. Also called Angular Second Moment.	37 39 40 41
Entropy	Measures randomness of gray level distribution (spatial disorder). Solid tone image would have an entropy value of 0.	37 39 41
Dissimilarity	Measures variation of gray level pairs in an image.	39
Contrast	Measures local gray level variation in an image. Heavy textures (greater dispersity in intensity values among neighboring voxels) give high values and smooth, soft textures give low values.	37 42
Correlation	Measures the linear dependency of gray level values in the GLCM, giving a value of between 0 (uncorrelated) and 1 (perfectly correlated).	42
Homogeneity	Measures the uniformity of non-zero entries in the GLCM. Weighs values by the inverse of the contrast weight. High homogeneity refers to textures that contain ideal repetitive structures (gray levels of each voxel pair are similar). Also called Inverse Difference Moment	38 39 41
Autocorrelation	Measures the magnitude of the fineness and coarseness of texture. Textures with more pairs of high gray levels give higher values.	42
Cluster Shade	Measures skewness of the GLCM. Greater asymmetry gives higher values.	41
Cluster Prominence	Measures skewness of the GLCM. Greater asymmetry gives higher values.	41

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Maximum Probability	Occurrence of the most predominant pair of neighboring intensity values. The value is expected to be high if the occurrence of the most predominant voxel pair is high.	41 42
Sum of Squares	Puts relatively high weights on the elements that differ from the average values of $P(i,j)$. Homogenous images give high values. Also called Variance.	40
Sum Average	Measures the relationship between co-occurences of pairs with lower intensity values and co-occurences of pairs with higher intensity values.	42
Sum Variance	Measure of heterogeneity that places higher weights on neighboring intensity level pairs that deviate more from the mean.	42
Sum Entropy	Measures randomness of gray level distribution (spatial disorder). Sum of neighborhood intensity value differences	41 42
Difference Variance	Measure of heterogeneity that places higher weights on differing intensity level pairs that deviate more from the mean.	42
Difference Entropy	Measures randomness/variability in neighborhood intensity value differences.	41 42
IMC I	Reduces to classical correlation coefficient when $p(x,y)$ is normal.	43
IMC II	Reduces to classical correlation coefficient when $p(x,y)$ is normal.	43
IDN	Measures local homogeneity of the image. Images with more uniform gray levels will keep the denominator low, resulting in higher value. Differences between the neighboring intensity values are normalized.	42
IDMN	Measures local homogeneity of the image. Images with more uniform gray levels will give higher values. Weights are the inverse of Contrast weights. The square of the difference between neighboring intenisty values are normalized.	40

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IMC, Information Measures of Correlation; IDN, Inverse Difference Normalized; IDMN, Inverse Difference Moment Normalized.