Title:

Investigation of radiomic signatures for local recurrence using primary tumor texture analysis in oropharyngeal head and neck cancer patients

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Table S1. Computed tomography- derived intensity histogram, shape and texture analysis features set

Feature Category	Features	Definition	References
Gray Level Cooccurrence Matrix 25 Gray Level Cooccurrence Matrix 3	Auto-Correlation	The Correlation texture measures the linear dependency of grey levels on those of neighbouring pixels.	1
	Cluster Prominence	A measure of the skewness or asymmetry	1
	Cluster Shade	A measure of the skewness or asymmetry	1
	Cluster Tendency	Assess if non-random structure exists in the data by measuring the probability that the data is generated by a uniform data distribution	1
	Contrast	Returns a measure of the intensity contrast between a pixel and its neighbor over the whole image.	2, 3
	Correlation	Returns a measure of how correlated a pixel is to its neighbor over the whole image.	2, 3
	Difference Entropy		2, 4
	Dissimilarity		1
	Energy		2, 3
	Entropy		1
	Homogeneity		2, 3, 4
	Homogeneity 2		2, 3, 4
	Information Measure Correlation 1		2, 3, 4
	Information Measure Correlation 2		2, 3, 4
	Inverse Diff Moment Norm		2, 3, 4
	Inverse Diff Norm		2, 3, 4

	Inverse Variance		4
	Max Probability		1
	Sum Average		2, 3, 4
	Sum Entropy		2, 3, 4
	Sum Variance		2, 3, 4
	Variance		4
GrayLevelRunLengthMatrix25	Gray Level Non-uniformity		5
	High Gray Level Run Empha		5
	Long Run Emphasis		5
	Long Run High Gray Level Empha		5
	Long Run Low Gray Level Empha		5
	Low Gray Level Run Empha		5
	Run Length Non-uniformity		5
	Run Percentage		5
	Short Run Emphasis		5
	Short Run High Gray Level Empha		5
	Short Run Low Gray Level Empha		5

Neighbor Intensity Difference 25 Neighbor Intensity Difference 3	Busyness		6
	Coarseness		6
	Complexity		6
	Contrast		6
	Texture Strength		6
Intensity Direct	Energy		4
	Global Entropy	The intensity entropy among all the voxels	4
	Global Max	The intensity maximum among all the voxels.	4
	Global Mean	The intensity mean among all the voxels.	4
	Global Median	The intensity median among all the voxels.	4
	Global Min	The intensity minimum among all the voxels.	4
	Global Std	The intensity standard deviation among all the voxels.	4
	Global Uniformity	The intensity uniformity among all the voxels.	4
	Inter-Quartile Range	The interquartile range of the intensity values among all the voxels.	4
	Kurtosis	Measure the peakedness of all the voxels' intensity.	4
	Local Entropy Max	First, at each voxel, compute entropy in its neighborhood region. Then, compute the maximum among all the voxel's entropy calculated from step 1.	4
	Local Entropy Mean	First, at each voxel, compute entropy in its neighborhood region. Then, compute the mean among all the voxel's entropy calculated from step 1.	4
	Local Entropy Median	First, at each voxel, compute entropy in its neighborhood region. Then, compute the median among all the voxel's entropy calculated from step 1.	4
	Local Entropy Min	First, at each voxel, compute entropy in its neighborhood region. Then, compute the minimum among all the voxel's entropy calculated from step 1.	4
	Local Entropy Std	First, at each voxel, compute entropy in its neighborhood region. Then, compute the standard deviation among all the voxel's entropy calculated from step 1.	4

	Local Range Max	First, at each voxel, compute range value (Max Value-Min Value) in its neighborhood region. Then, compute the median among all the voxel's range value calculated from step 1.	4
	Local Range Mean	First, at each voxel, compute range value (Max Value-Min Value) in its neighborhood region. Then, compute the mean among all the voxel's range value calculated from step 1.	4
	Local Range Median	First, at each voxel, compute range value (Max Value-Min Value) in its neighborhood region. Then, compute the median among all the voxel's range value calculated from step 1.	4
	Local Range Min	First, at each voxel, compute range value (Max Value-Min Value) in its neighborhood region. Then, compute the minimum among all the voxel's range value calculated from step 1.	4
	Local Range Std	First, at each voxel, compute range value (Max Value-Min Value) in its neighborhood region. Then, compute the standard deviation among all the voxel's range value calculated from step 1.	4
	Local Std Max	First, at each voxel, compute standard deviation in its neighborhood region. Then, compute the maximum among all the voxel's standard deviation value calculated from step 1.	4
	Local Std Mean	First, at each voxel, compute standard deviation in its neighborhood region. Then, compute the mean among all the voxel's standard deviation value calculated from step 1.	4
	Local Std Median	First, at each voxel, compute standard deviation in its neighborhood region. Then, compute the median among all the voxel's standard deviation value calculated from step 1.	4
	Local Std Min	First, at each voxel, compute standard deviation in its neighborhood region. Then, compute the minimum among all the voxel's standard deviation value calculated from step 1.	4
	Local Std Std	First, at each voxel, compute standard deviation in its neighborhood region. Then, compute the standard deviation all the voxel's standard deviation value calculated from step 1.	4
	Mean Absolute Deviation	The mean absolute deviation of the intensity values among all the voxels.	4
	Median Absolute Deviation	The median absolute deviation of the intensity values among all the voxels.	4
	Percentile	Percentiles of the intensity values among all the voxels.	4

	Quantile	Quantiles of the intensity values among all the voxels.	4
	Range	The intensity range (Max Value-Min Value) among all the voxels.	4
	Root Mean Square		4
	Skewness	Measure the asymmetry of all the voxels' intensity.	4
	Variance		4
Intensity Histogram	Inter-Quartile Range	The interquartile range of the occurrence probability values in the histogram.	4
	Kurtosis	Measure the peakedness of the occurrence probability values in the histogram.	4
	Mean Absolute Deviation	The mean absolute deviation of the occurrence probability values in the histogram.	4
	Median Absolute Deviation	The median absolute deviation of the occurrence probability values in the histogram.	4
	Percentile	Percentiles of the occurrence probability values in the histogram.	4
	Percentile Area	Percentiles of values in the accumulative histogram.	4
	Quantile	Quantiles of the occurrence probability values in the histogram.	4
	Range	Measures the range (Max Value-Min Value) of the occurrence probability values in the histogram.	4
	Skewness	Measure the asymmetry of the occurrence probability values in the histogram.	4
Shape	Compactness 1	Compactness1= (Volume)/(sqrt(pi)*(SurfaceArea)^(2/3)	4
	Compactness 2	Compactness2= 36*pi*(Volume^2)/((SurfaceArea)^3) .	4
	Convex	Measure the proportion of the pixels in the convex hull that are also in the region.	4
	Convex Hull Volume	The mean volume of the 2D convex hulls that are the convex envelopes of each slice's binary mask.	4
	Convex Hull Volume 3D	3D volume of the convex hull that is the convex envelope of binary mask.	4
	Mass		4
	Max 3D Diameter	Max 3D Diameter= largest pairwise Euclidean distance between voxels on the surface of the tumor volume.	4

	Mean Breadth	Denotes integral of mean curvature	4
	Number Of Voxel	The number of voxels treating the edge voxels differently.	4
	Orientation	Measures the angle between the x-axis and the major axis of the ellipse in 2D.	4
	Roundness	Measures how much the binary mask is close to circle in 2D.	4
	Spherical Disproportion		4
	Sphericity		4
	Surface Area	The surface area of the binary mask.	7
	Surface Area Density	Surface Area Density= (surface area of the binary mask)/(volume of the binary mask).	4, 7
	Volume	The physical volume treating the edge voxels differently.	7

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