New AASPI Algorithms: September 2015				
Application Name	**Application Description**	**Location**	**Software Documentation**	**AASPI References**
kmeans3d	Multiattribute clustering of up to 8 attributes using the classic k-means algorithm. All clustering is computed using the Mahalanobis (inverse covariance matrix weighted) distance.	Under aaspi_util > Volumetric Classification tab	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-kmeans3d.pdf	http://mcee.ou.edu/aaspi/submitted/2015/Tao_Interpretation_1.pdf
pca3d	Multiattribute projection of up to 8 attributes onto the first n eigenvectors of the multiattribute covariance matrix,resulting in n "principal components"	Under aaspi_util > Volumetric Classification tab	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-pca3d.pdf	http://mcee.ou.edu/aaspi/submitted/2015/Tao_Interpretation_1.pdf
kuwahara3d	Attribute smoothing and blocking using a 3D Kuwahara filter, preconditioning multiattribute data for subsequent clustering or projection onto a manifold using programs kmeans3d, pca3d, som3d, gtm3d, or psvm3d.	Under aaspi_util > Image Processing tab	http://mcee.ou.edu/aaspi/documentation/Image_Processing-kuwahara3d.pdf	http://mcee.ou.edu/aaspi/publications/2016/Jie_semi_2016.pdf
vector_correlate_3d	Correlates two vector attribute volumes, such as structural deformation (e.g. k1 and k1_strike) with anisotrpy (e.g. AVAZ magnitude and strike).	Under aaspi_util > Attribute Correlation Tools tab	http://mcee.ou.edu/aaspi/documentation/Attribute_Correlation-	http://mcee.ou.edu/aaspi/publications/2016/shiggy_1.pdf
q_estimation	Provides three common Q estimation techniques including the spectral ratio, central frequency shift, and peak frequency shift methods. Inputs are previously computed spectral magnitude components extracted	Under aaspi_util > Horizon-based Classification	http://mcee.ou.edu/aaspi/documentation/Image_Processing-kuwahara3d.pdf	http://mcee.ou.edu/aaspi/publications/2016/Fangyu_2016.pdf
make_training_clusters	Choose previously-defined polygons generated using program aaspi_plot for use in supervision for gtm3d	Under aaspi_util > Volumetric Classification tab	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification_m	simple utility. No technical paper.
fault_enhancement	Compute fault (for coherence input) or axial plane (for curvature input) dip magnitude and dip azimuth.	Under aaspi_util/Image Processing tab	http://mcee.ou.edu/aaspi/documentation/Image_Processing-fault_enhancement.pdf	http://mcee.ou.edu/aaspi/publications/2016/Gabe1.pdf

AASPI Coherent Noise Suppression Workflow	A ground roll suppression workflow to be a applied to unmigrated patches of seismic data, consisting of linear moveout, estimation of residual dip, estimation of coherent noise events, followed by reverse linear moveout	under aaspi_util_prestack > /AASPI_Workflows tab	http://mcee.ou.edu/aaspi/documentation/Image_Processing-fault_enhancement.pdf	http://mcee.ou.edu/aaspi/publications/2016/sumito_grounds.pdf
AASPI Prestack Structure-Oriented Fitlering Workflow	A coherent noise suppression workflow to be a applied to prestack time- or depth-migrated gathers, consisting of stack, dip estimation, coherence estimation to detect edges, and 5D prestack edge-preserving structure-oriented filtering	under aaspi_util_prestack > AASPI_Workflows tab	http://mcee.ou.edu/aaspi/documentation/Prestack_Workflows-Prestack_structure_oriented_filtering.pdf	http://mcee.ou.edu/aaspi/publications/2016/Zhang_sof_noise.pdf