

Enhanced AASPI Algorithms: November 2020

Application Name	Application Description	Location	Software Documentation
instantaneous_attributes	Sweetness is now computed as the ratio of the envelope and the square root of the average frequency. This change removes artifacts when dividing by the square root of the instantaneous frequency.	under aaspi_util > Single Trace Attributes	http://mcee.ou.edu/aaspi/documentation/Single_trace_attributes-instantaneous_attributes.pdf
spec_cmp, spec_cwt	Updated defaults for depth-migrated data	under aaspi_util > Spectral Attributes	http://mcee.ou.edu/aaspi/documentation/Spectral_Attributes-spec_cmp.pdf
som3d	Replaced output display of prototype vectors with a crossplot display of the data projections onto SOM axis 1 and SOM axis 2, thereby providing images consistent with those constructed using crossplot tools in Petrel and other interpretation packages	under aaspi_util > Volumetric Classification	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-som3d.pdf
som3d	Using the same crossplot construct, the user can now produce a movie of the prototype vectors projected onto the latent space for each iteration, thereby seeing how it converges	under aaspi_util > Volumetric Classification	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-som3d.pdf
som3d	Each voxel is now provided with the probability that it belongs to a given (colored) class. Because the input data have been scaled such their histogram approximates a Gaussian, the distance of each voxel to the nearest prototype vector (class) is measured using the Mahalanobis distance of the scaled attributes, rather than the covariance matrix of each class. In this manner, we avoid addressing the issue of clumped prototype vectors, each of which would exhibit relatively small variances.	under aaspi_util > Volumetric Classification	http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-som3d.pdf

dip3d_gst	Reworked to handle severe mutes and no permit zones that gave rise to curvature artifacts. The previous fix of killing voxels with incomplete windows resulted in shrinking the output at each iteration. Now, the result will be given by the completely filled Kuwahara window that provides the most confident (most planar) result.	under aaspi_util > Geometric Attributes	http://mcee.ou.edu/aaspi/documentation/Geometric_Attributes-dip3d.pdf
hlplot, hsplot	Now allow a user defined color bar to be used in place of the (default) hue axis. In this manner, an interpreter can modulate a company specific or common software colorbar (such as Hampson Russell's Strata impedance inversion) by lightness and saturation.	under aaspi_util > Display Tools	http://mcee.ou.edu/aaspi/documentation/Display_Tools-hlplot.pdf ; http://mcee.ou.edu/aaspi/documentation/Display_Tools-hsplot.pdf
fault_enhancement, skeletonize3d	Reworked to handle issues specific to CNN-generated fault probability volumes	under aaspi_util > Image Processing	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-cnn_fault_prediction.pdf
pca3d, ica3d, kmeans3d	Now accessed using the multiattribute toolbox, thereby allowing comparison of multiple algorithms using the same training, validation (if appropriate) and target data.	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-analyze_input.pdf
kxky_cwt	Better handling of mute zones	under aaspi_util > AASPI Workflows > AASPI KX-KY-CWT Footprint Suppression Workflow	http://mcee.ou.edu/aaspi/documentation/Spectral_Attributes-kxky_cwt.pdf
Most programs	Explicit listing of output file naming convention in 80% of programs	Multiple programs	
som_waveform_classification	Reworked to provide more intuitive input and output		http://mcee.ou.edu/aaspi/documentation/Formation_Attributes-som_waveform_classification.pdf

All geometric and spectral attributes algorithms	Rework all algorithm defaults to work well with depth-migrated data with vertical axes in m or ft as well as in km and kft		
gtm3d	Rework gtm3d to run on smaller memory machines		http://mcee.ou.edu/aaspi/documentation/Volumetric_Classification-gtm3d.pdf
aaspi_plot	Added histogram option under "File" tab	under aaspi_util > AASPI QC Plotting tab	

