

New AASPI Algorithms: August 2019

Application Name	Application Description	Location	Software Documentation	AASPI References
log_parasequence_analysis	A expectation maximization changepoint analysis filter applied to well logs that highlights parasequence boundaries and computes well log attributes including upward fining (dirtying), upward coarsening (cleaning), and the residual misfit	under aaspi_util > Well Log Utilities	in progress	Identification and quantification of parasequences using an expectation maximization filter: Defining well log attributes for reservoir characterization
defining_polygons	Uses a feature in aaspi_plot to label seismic facies for machine learning by drawing polygons	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-defining_polygons.pdf	simple utility
polygons_to_points	Generates a point set of voxel indices that fall within each polygon	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-polygon_to_points.pdf	simple utility
generate_training_data	Extracts values from a suite of attribute volumes that correspond to points defined by polygons	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-generate_training_data.pdf	simple utility
analyze_input	Use training data to generate a model (at present, a PNN model- future models will be GMM, SOM, GTM, RF, or PSVM)	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-analyze_input.pdf	simple utility

create_model	Constructs a PNN model	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-create_model.pdf	simple utility
perform_classification	Classifies the data within the target volume	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-perform_classification.pdf	http://mcee.ou.edu/aaspi/publications/2019/Lu-Bo-Robles-et-al-Supervised-seismic-facies-classification-using-PNN-attribute-selection.pdf
CNN_image_classification	Uses Tensorflow, convolutional neural networks, and transfer learning to classify digital images such of core, fossils, or thin sections.	under aaspi_util > Machine Learning Toolbox	http://mcee.ou.edu/aaspi/documentation/Machine_Learning_Toolbox-cnn_image_classification.pdf	http://mcee.ou.edu/aaspi/submitted/2019/Pires de Lima et al 2019-CNN and biostratigraphy.pdf ; http://mcee.ou.edu/aaspi/publications/2019/Pires de Lima et al 2019-Convolutional neural networks as an aid in core lithofacies classification.pdf ;

