INTRO TO ENERGY MACHINE LEARNING - SYLLABUS

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Workshop Objective: To learn the theory and practical application of machine learning within the Energy industry to help improve data-driven decision making.

Registration link - https://www.spegcs.org/events/4445/

Detailed Course Outline:

Time	Topic	Objective
8:00 AM - 9:00 AM	Introduction to Machine Learning	Provide definitions, fundamental concepts of inference and prediction along with the opportunity and limitations of machine learning.
9:00 AM - 10:00 AM	Inference: Dimensionality Reduction and Clustering	Motivation and methods for inferential machine leaning methods including dimensionality reduction and clustering with potential applications
10:00 AM - 11:00 AM	Prediction: k Nearest Neighbors	Motivation and methods for predictive machine learning methods including hyper parameter tuning with k nearest neighbors.
11:00 AM - 12:00 PM	Prediction: Tree-based Regression	Introduce tree-based modeling as one of the most interpretable machine learning prediction methods and as a prerequisite for more powerful ensemble methods.
12:00 PM - 1:00 PM	**Lunch**	
1:00 PM - 2:00 PM	Prediction: Ensemble Tree-based Regression	Introduce predictive machine learning with ensemble methods for prediction with bagging and random forest.
2:00 PM - 2:30 PM	Prediction: Neural Networks	Introduce and demonstrate neural networks as powerful and flexible machine learning prediction methods.
2:30 PM - 3:00 PM	Examples and Closing Remarks	Provide a set of advanced machine learning applications, describe the necessary skills to be an effective data scientist for spatiotemporal energy applications and then gather participant feedback.