1/ West Nile Virus (WNV)

WNV is the leading cause of mosquito-borne disease in United States. It's most commonly transmit to people by the bite of infected mosquito. Currently there are no vaccination or medication to treat WNV in people. Most people infected with WNV show little to no symptom. However, less than 1 percent of infected people can develop a serious, even fatal, illness. Therefore, it's critical to detect whether WNV is present at specific place and time.

The objective of this capstone project is to predict whether WNV is present using the supervised machine learning. The data, provided by Chicago Department of Public Health, includes GIS, weather, mosquito trap and mosquito spray schedule. I want to investigate this data to draw any correlation between the dataset and use it to build my prediction model.

2/ Best Completion Techniques for Unconventional Oil and Gas

It's common practice in oil and gas industry to drill as many wells in a lease, to perforate and pump proppants as much as possible and hope for good production. This blindfolded practice often lead to undesired production performance, especially in unconventional resources. In this capstone project, I want to gather data about geological formation, historical production and completion design. Then build the supervised machine learning to predict the best technique for optimizing oil & gas production at particular shale play. The geological and well logs will be available at UTLand, while historical production and completion can be found at DrillingInfo, IHS and Texas Railroad. One of the challenges of this capstone project is to find the detailed completion, which often not available to the public.

3/ Predicting Lithofacies

It's often time-consuming and tedious job for geologists to read and analyze well logs to predict lithofacies. So, the objective of this capstone project is to build different supervised machine learning models to predict lithofacies. The dataset used in this project is a collection of over 2000 wells made public by the Alberta Geological Survey's Alberta Energy Regulator.