# CISC 499 Project

**Title:** Prostate cancer staging with ultrasound data analysis

**Description:** Prostate cancer is one of the most common types of cancer in men. Definitive diagnosis is performed by pathologic evaluation of uniformly-spaced core biopsies from prostate. This method is invasive and because of the limited number of core samples, has a high false negative rate. Transrectal ultrasound imaging is normally used as anatomical guidance for biopsies, but recent studies suggest that it also contains cancer characteristic information. These information can be used decrease or eliminate invasive biopsies for cancer localization and grade estimation. The goal of this project is to develop a machine learning approach to predict the stage of prostate cancer based on the transrectal ultrasound data. Student(s) will be provided with the dataset consists of multi-frame high-frequency ultrasound RF data acquired during guided biopsies, along with the pathology validated cancer grade of the extracted core. The ultrasound data has both spatial and temporal information and can be either treated as signal or image. The workflow including, but not limited to, visualization, ROI selection, preprocessing, feature extraction, model training.