AC 2008-1852: OBJECT CLASSIFICATION USING ROBOTIC MANIPULATOR INSTRUMENTED WITH SENSORS

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The goal of this project is to classify objects based on their individual characteristics. This project will span over two semesters in which the first semester will be used to research state of the art sensor technology, specify desired object properties, acquire necessary sensors, and calculate a useful calibration curve for each sensor. The second semester will be used to design an end-effectors capable of housing the sensors and successfully interacting with the target object to obtain useful data. The three selected object properties are material type, roughness and temperature. The capacitive sensor to be used will consist of a section of ribbon cable which will allow us to initially place the object into one of five material type categories: metal, wood, plastic, cloth etc. The roughness sensor to be used will consist of a phonograph needle which we will calibrate to determine the surface characteristics of the target object. Lastly, we will include a resistive sensor to obtain the objects temperature.