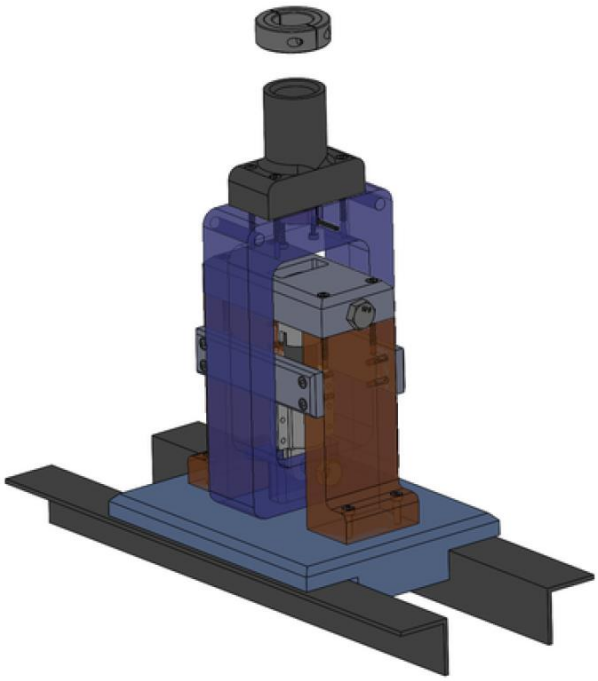
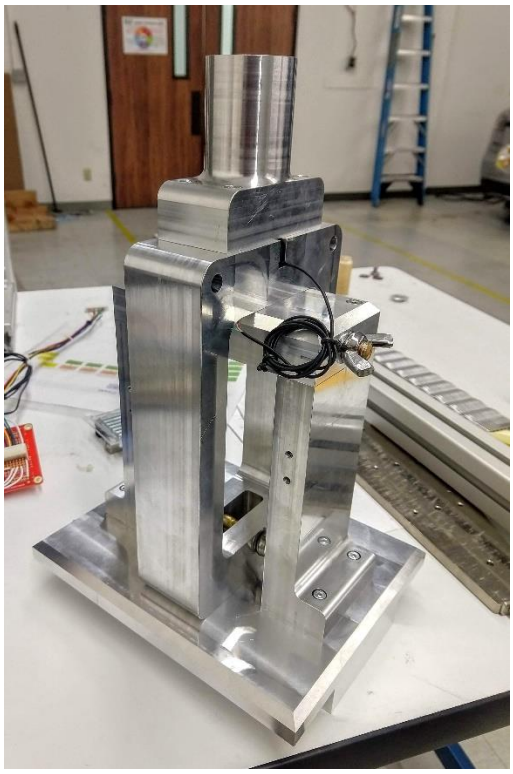
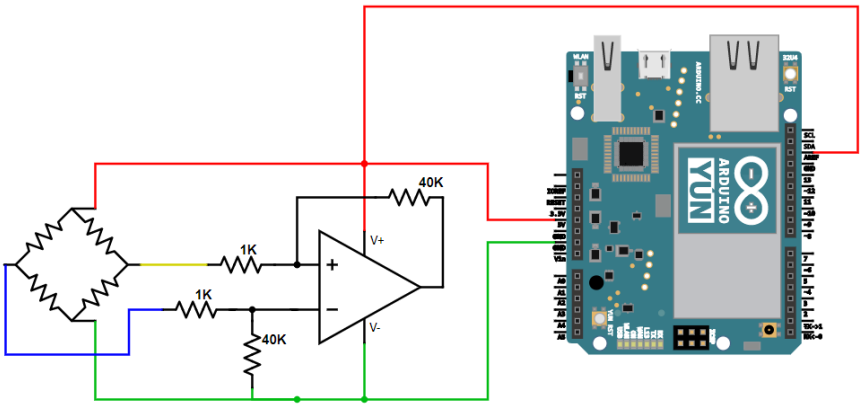
Adhesive bond strength test rig

I designed this test rig was to fit in our 12 ton hydraulic shop press and measure the breaking strength of different adhesive joint designs. I ran FEA simulations and itterated the design to support 500 lbs with a yielding factor of safety of over 3. I selected a load cell was to measure the breaking force of the adhesive bond. In addition to the mechanical design and wiring, I wrote a detailed test plan and programed an arduino for data aquisition.







Circuit diagram: The differential amplifier was needed to amplify the bridge voltage to a level readable by the Arduino. The Arduino was used to log data and save the breaking force.