The goal of this project is to create a catapult inspired from the web of a slingshot spider using engineering material that can achieve directional launch with high speed/acceleration. The project is purely for research and results. The slingshot spider can achieve an acceleration of about 130 gs. The goal was to reach 1/10th the acceleration the spider can.

This shows how the additional strands added allow for the spring constant to increase. This will allow for a greater energy storage inside the web.

The web geometry was an important part of the spider’s ability to achieve such a high acceleration. Following this, the next step is to find a suitable material. Latex rubber tubing was chosen due to its high elasticity and tensile strength.

The data was analyzed first using the tracker software. This software analyzes the video and was able to obtain the velocity of each projectile. After this was complete calculations were preformed to find the acceleration, potential energy, and energy density. The table below compares the slingshot spider’s data to the maximum values achieved from each of the web designs.