# Nature Inspired Model for Tower Designs

Spider webs are an engineering marvel as the silk used to create them has a tensile strength 6 times stronger than steel. Spider webs have overlapping optimization purposes, the foremost of which is to catch suitable prey and withstand environmental perturbations (e.g., wind). Through constant trial and error, over thousands of years, spiders have evolved how to make effective and robust webs.

Cob Type

Orb Type
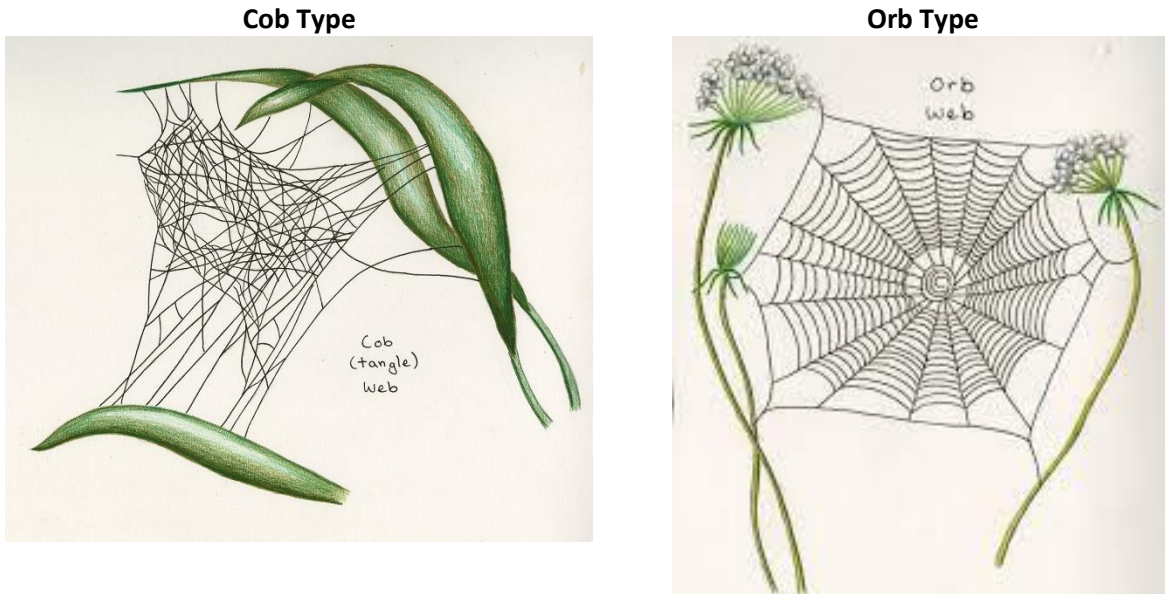
*Source : [How to Recognize Spiders By their Webs - Bay Nature Magazine](#)

Using Logistic Regression (L2) to extract useful Spider Web characteristics for tower designs

A machine learning model (Logistic Regression using L2 regularization), shows that cob webs are related to Maximum Breaking Stress of a spider web. Figure 2 below, shows the feature importance of each feature relative to classifying a type of spider web. If the bar extends to the right, the feature relates to Orb webs, while extensions to the left means the feature relates to Cob webs. Since Mr. Wayne wants to design his tower buildings using a nature-based design, I suggest that he designs his building similar to **cob spider webs.** Not only is it visually elegant and aesthetic, the design is also durable and strong as suggested by the machine learning model.

Figure 2. Feature Importances of ML model