Kinematics Model:

**Figure XXX** shows the mathematical model used for the forwards and inverse kinematics. The gripper used in the project can be assumed to be a non-rotating, , square. This model can be mathematically simplified by instead assuming a point gripper, and reducing both frame dimensions by .

The forward kinematics model is defined by application of the cosine rule:

This can be simplified without application of trigonometric functions for code optimisation:

Finally, the inverse kinematics is defined as:

It should be noted that this model allows for independence between the system tension and gripper position. The tension is controlled by simply retracting or extending the cable length by equal amounts on all four servos, and the cable elasticity resolves position.