Optimization of Cable Robots

(source: 'Mathematical Modeling of Cable Sag, Kinematics, Statics, and Optimization of a
Cable Robot', thesis proposal by Dheerendra Sridhar,
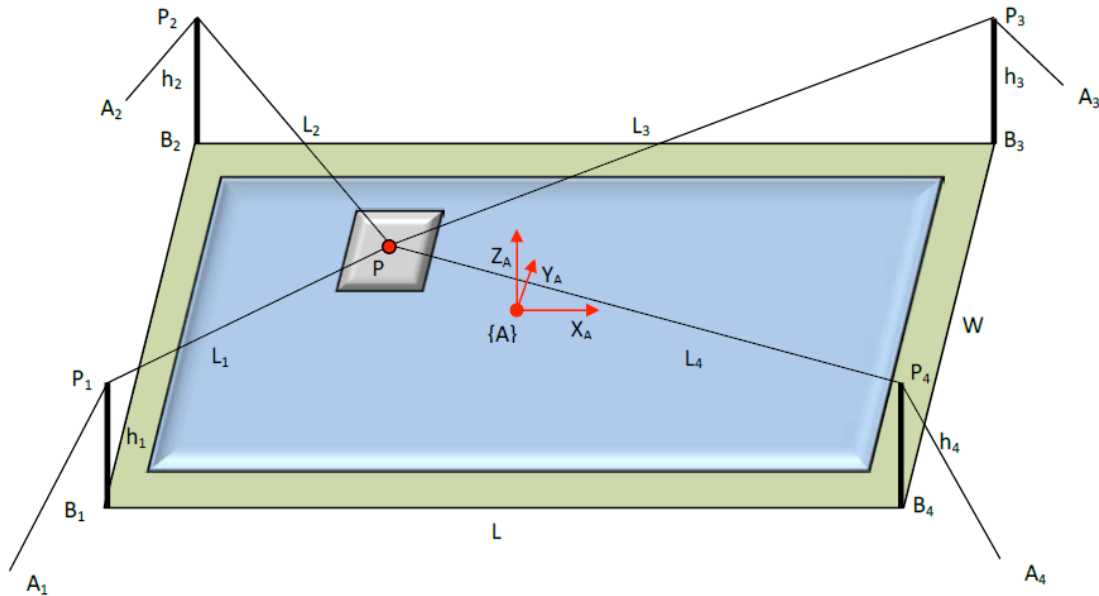Mechanical Engineering, Ohio University)

Figure 1: Algae Harvesting Cable Robot System
Designed by Robert L Williams II, Jesus Pagan, David J. Bayless and Noah Needler
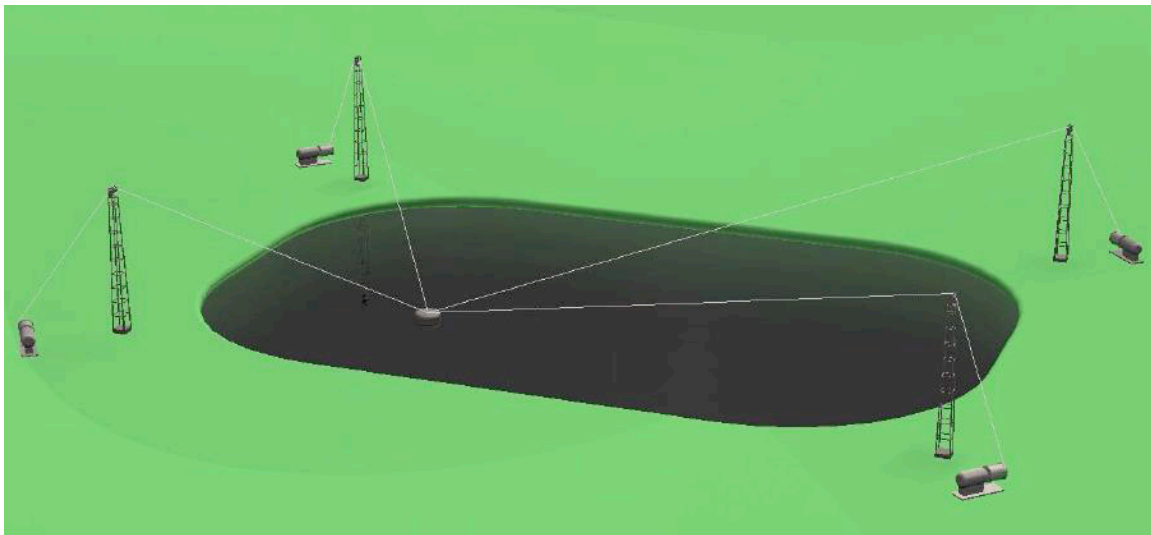(Mechanical Engineering, Ohio University, [1])

Figure 2: CAD Model of the Algae Harvesting Cable Robot System

Borgstrom in [2] describes the use of **linear programming** to find optimal tension in cables
of a cable robot that assumes straight-line model for the cables. The algorithm used here was
a popular linear programming solution procedure namely the Simplex Method.

References

[1] Needler, N. J., 2013, "Design of an Algae Harvesting Cable Robot, Including a Novel Solution to the Forward Pose Kinematics Problem," Ohio University.

[2] Borgstrom, P. H., Jordan, B. L., Sukhatme, G. S., Batalin, M. A., and Kaiser, W. J., 2009, "Rapid Computation of Optimally Safe Tension Distributions for Parallel Cable-Driven Robots," IEEE Trans. Robot., **25**(6), pp. 1271–1281.