Model rockets are mainly scale models of professional rockets or functional models built for enjoyment or for competitions; they use fins to maintain stability and are therefore, passively controlled. However, most professional rockets are actively controlled and so can perform more complicated maneuverers and have different aesthetics compared to model rockets.

Therefore, this paper will aim to implement active control in a model rocket by designing and comparing different controllers, using machine learning and control theory. The main criteria for determining the optimal controller is accuracy, effort, safety, robustness and ease of implementation.

I will cover the rocket dynamics, based on Niskanen’s work, which provides an extension to Barrowman’s work outlining how to calculate the aerodynamic forces acting on most model rockets. Also, I will also choose the optimal controller using the proposed criteria.