

## METHODOLOGY

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IA ASTRONOMY

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# TVC MODEL ROCKET

## BACKGROUND

Model rocketry is a hobby for enthusiasts of astronomy and space exploration. It involves building and launching small-scale rockets, from kits to custom designs. These rockets often have sensors to collect telemetry data for flight analysis. It serves as a stepping stone for aspiring engineers, offering insights into real-world space missions.

## PROBLEM STATEMENT

Model rockets often fly with fixed fins, which don't provide active control. This is impractical for real-world space applications, where rockets must guide themselves to deliver payloads. Rockets requiring active stabilization use methods different methods, and we chose Thrust Vector Control, used by NASA and SpaceX for precise maneuvering.

## RESEARCH QUESTION

How can we actively stabilize a model rocket using Thrust Vector Control (TVC)?

## EXISTING SOLUTIONS

- ✕ Motorized Planer/Grid Fins
- ✕ Roll Stabilization
- ✕ Jet Vanes
- ✕ Reaction Control System

## REFLECTION

This project took a lot of creative engineering and designing regarding building the physical rocket and testing. The physical aspect would provide accurate telemetry but it relies on the code to do so.

