The Train that Flies

Abstract

To find out if a MagLev Train is faster than an everyday one. Which is faster: a MagLev Train or a Casual Train. The MagLev Train is going to be faster than a casual train. Magnets were put on a track and a block to model the MagLev Train. The MagLev Train had a faster average than a casual train. The tests and trials supported my hypothesis; the MagLev train had a faster time to finish the track than a casual train.

Introduction

Purpose
To find which is faster a MagLev train or a normal train

Problem
Is a MagLev train faster than a casual train?

Background Research
In the Electromagnetic Suspension (EMS) system the train is wrapped around the track and electromagnets attached to the bottom of the train are attracted upwards to the guide way. The train is held about 1 cm above the track by this attraction. These electromagnets also propel the train and other embedded magnets keep the train in the middle of the track. The train does not need wheels and the maximum speed reached is 482 kilometers per hour.

Hypothesis
The MagLev Train will be faster than the casual train.

Methods

Subjects

The time it takes for the different method of train to finish the track

Variables

Independent: The function of how each train moves

Dependent: The time it takes for each train to finish the track

Controlled:

- The force to start the movement of each train
- The distance

Materials

- Wide corner braces
- Foam Board
- 60mm x 10mm x 3mm
- 30mm x 10m x 3mm

Procedures

- Put the train on the foam board and measure the width
- Cut it out throughout the whole foam board
- Do this twice
- Cut one of them into two long ways
- Get two wide corner braces and tape or glue them to the larger piece of foam board
- Then use the other side of the corner brace to add one of the smaller piece of foam board
- same with the other side
- Put the longer magnets across the side of the track, there will be gaps
- To fill these in, get the smaller magnets and put those next to the gaps
- Aline six large popsicle sticks
- Put four and a quarter more across that
- Glue those together
- Cut the popsicle sticks off

- Get four of the longer magnets
- Glue them on the long side
- Have the north side of the magnet facing up
- After drying get tape and put it over the magnets to make sure that they won’t fall off
- Extra
- Get checkered outlines and put on the wall o track
- Get your choosing color or ribbon and outline the outline

Results

Table(s)

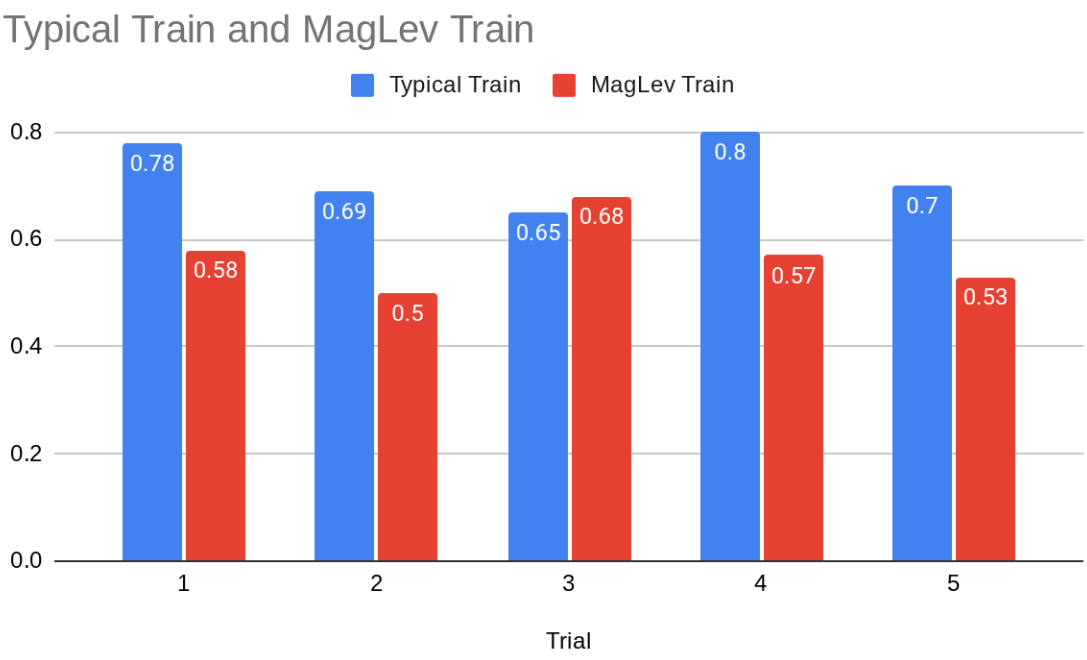
Time to finish track (Seconds)

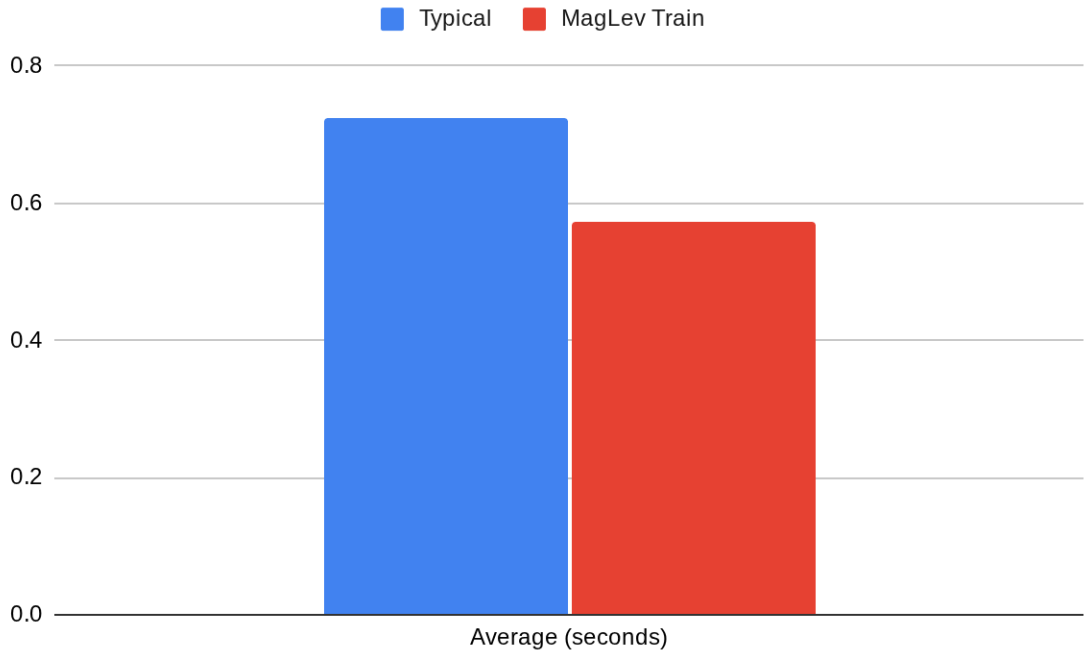
Trial	Typical Train	MagLev Train
1	0.78	0.58
2	0.69	0.50
3	0.65	0.68
4	0.80	0.57
5	0.70	0.53

Average Time (in Seconds)

Name	Typical	MagLev Train
Average (seconds)	0.724	0.572

Graph(s)





Analysis

Comparing the averages of the normal train, 0.724 seconds, and MagLev Train 0.524 seconds. The MagLev Train is approximately 21% faster than the normal train. The data

does support my hypothesis because the MagLev train finished the track in a faster time then a normal train.

Discussion

Conclusion

The trials and averages of each train show that the MagLev train is faster. This supports my hypothesis through the trials with the MagLev being approximately 21% faster than a typical. A typical train has traction making the train slower then what it could be. A MagLev Train takes traction out of the equation making the train faster with magnets that makes it float and it won't drag on tracks.

Application

The Typical train has actual traction holding back the train from going faster and makes a lot of noise. A MagLev Train is floating through magnets lifting it off the tracks and moving faster; making no noise.

Recommendations

If I were to do this project again I would make sure to have all the materials I needed before I started building the train. The noise level can also be a factor as well as the brakes on each of the trains. I think a mistake I had was not considering the repulsion of the magnets on the track from repelling each other.

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