

1 Conclusion

To develop a strategy to approach the problem, we analyzed the competition requirements and decided to design a reliable locomotive. Using function decomposition, we divided the problem into simple tasks of the locomotive. We generated a variety of concepts that were creative and promising for the competition. We used prototypes and simulations to test the capabilities of our designs; however, our evaluation focused on the performance of various concept fragments instead of holistic performance. This resulted in a poor performance from our final prototype at the competition; specifically, the incompleteness of over half of the rounds resulted in a very low base score. The mechanical system of our prototype is inadequate for competition. Therefore, we recommend using a design similar to that of Team D3.

With the future in mind, we believe it is important to develop a braking system for an electric train. Although the electronic braking system proposed by our team is unfeasible for the scope of the competition, it is promising for real world applications. Given enough time, combining the positive aspects of our electronic system with the mechanical aspects of Team D3's design would result in an overall superior train intended for full scale development.