

1.1 PROBLEM STATEMENT

The project aims to enhance the excitement and challenge of RC racing by introducing innovative traps on the track. It provides an engaging and dynamic environment for RC enthusiasts, offering a unique and entertaining experience.

In terms of feasibility, the project could be suitable for a class or future implementation with careful planning and collaboration. The combination of physical traps and cybersecurity elements adds a multidimensional aspect to the RC track. It not only tests the participants' skills in creating autonomous cars, but also introduces elements of strategy and adaptability, making it a compelling project for educational purposes or recreational events. The integration of electronic components and cybersecurity features may require technical expertise, making it ideal for a senior design project or an advanced class with appropriate resources and support. With proper guidance and resources, the implementation of such a project can offer valuable hands-on experience in electronics, cybersecurity, and creative design.

1.2 REQUIREMENTS & CONSTRAINTS

As we create a racetrack for two RC cars, there are many factors that must be considered. The materials used to physically create the track must be durable enough to allow for multiple rounds of testing, as well as multiple attempts for each car team to perform the race. The largest consideration for this project is likely the creation and implementation of the traps. Each trap, be it software or hardware based, must be tested to ensure that it will slow the cars as they progress through the race while still allowing them to complete it. Special attention is given to the traps' compliance with legal standards, ensuring that RF signals employed for hacking or jamming purposes are weak enough not to cause disturbances. Furthermore, the integration of a timing system is vital for determining race winners, and the applied science complex parking lot 104 provides an ideal real-world testing environment for the track. The final consideration lies in collaboration with the teams in charge of creating the cars.

1.3 ENGINEERING STANDARDS

IEEE 260 Standard Letter Symbols for Units of Measurement, IEEE-260-1978 (now 260.1-2004)

IEEE 829	Software Test Documentation
IEEE 1028	Standard for Software Reviews and Audits
IEEE 1074	Software Development Life Cycle
IEEE 1547	Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
IEEE 2050	RTOS for embedded systems standard
IEEE C37.2040	Standard Cybersecurity Requirements for Substation Automation, Protection, and Control Systems

1.4 INTENDED USERS AND USES

The racetrack functions as a focal point for the local community, uniting individuals around common interests and activities. It can evolve into a hub that enhances community connections. Beyond being a

communal gathering space, racetracks also offer enjoyable and educational pursuits, such as RC car racing, engaging young people in a positive hobby that fosters connections with their peers.