

## Project 2: Cretaceous Gardens Controller (CGC)

Description: We are billionaire philanthropists who have approached your team with the task of building the software that will maintain our new theme park on the remote Isla Trueno near Costa Rica. Our team of genetic scientists has achieved the groundbreaking feat of de-extinction of the 66 million-year-old *Tyrannosaurus Rex* and we wish to share it with the public, of course for a nominal fee. The theme park will be named Cretaceous Gardens, and will offer visitors the experience of viewing this specimen first-hand.

Logistics (Constraints): Visitors will arrive by barge to a port on the south end of the island. They will each pay through an automated station and get a unique token (ticket specific to the person) for vehicle access and viewing. A self-driving car will stop at the south-end and pick up at most 10 guests, each with an appropriate token. The vehicle will lock securely then drive to the north-end of the island; its position being accounted for at all times. On the north end of the island is the T-Rex exhibit: a massive enclosure featuring an electric fence around the perimeter and at least one security camera. Once the visitors arrive at the exhibit, the vehicle doors unlock and they have a chance to get out, take pictures, explore, and try to see the dinosaur. After some allotted time the vehicle will sound an alarm telling visitors it is time to leave. The vehicle will not leave until all visitors have returned. It then locks securely and drives back to the south end, again its position accounted for at all times. There must exist a strict emergency protocol in place, such that if the electric fence fails at any moment an alarm will sound both at the north and south end, and in the vehicle. The system must act as quickly as possible to get every visitor safely back to the south end of the island.