AIOR: Automated Inter-Office Documents Delivery Robot Using RFID

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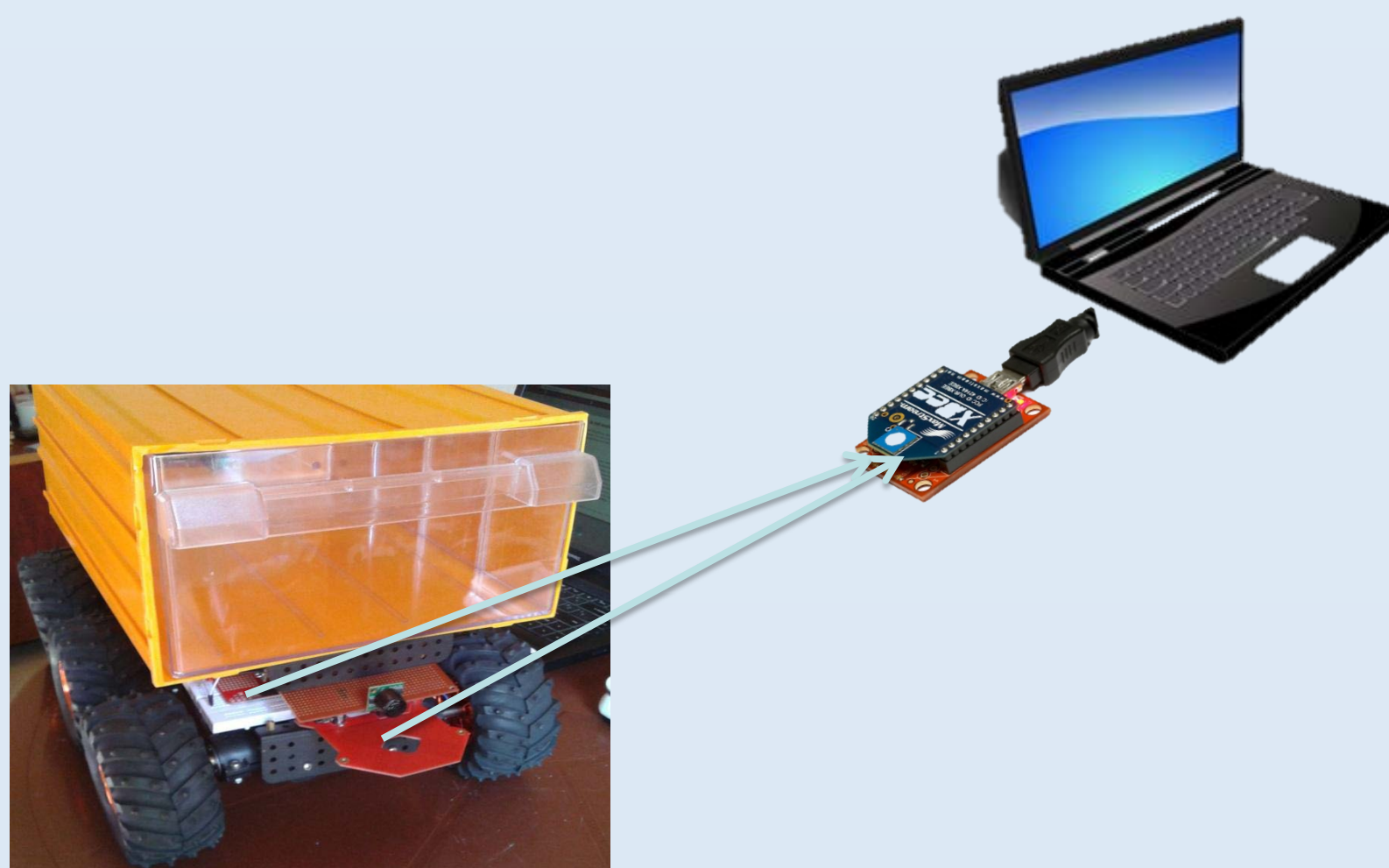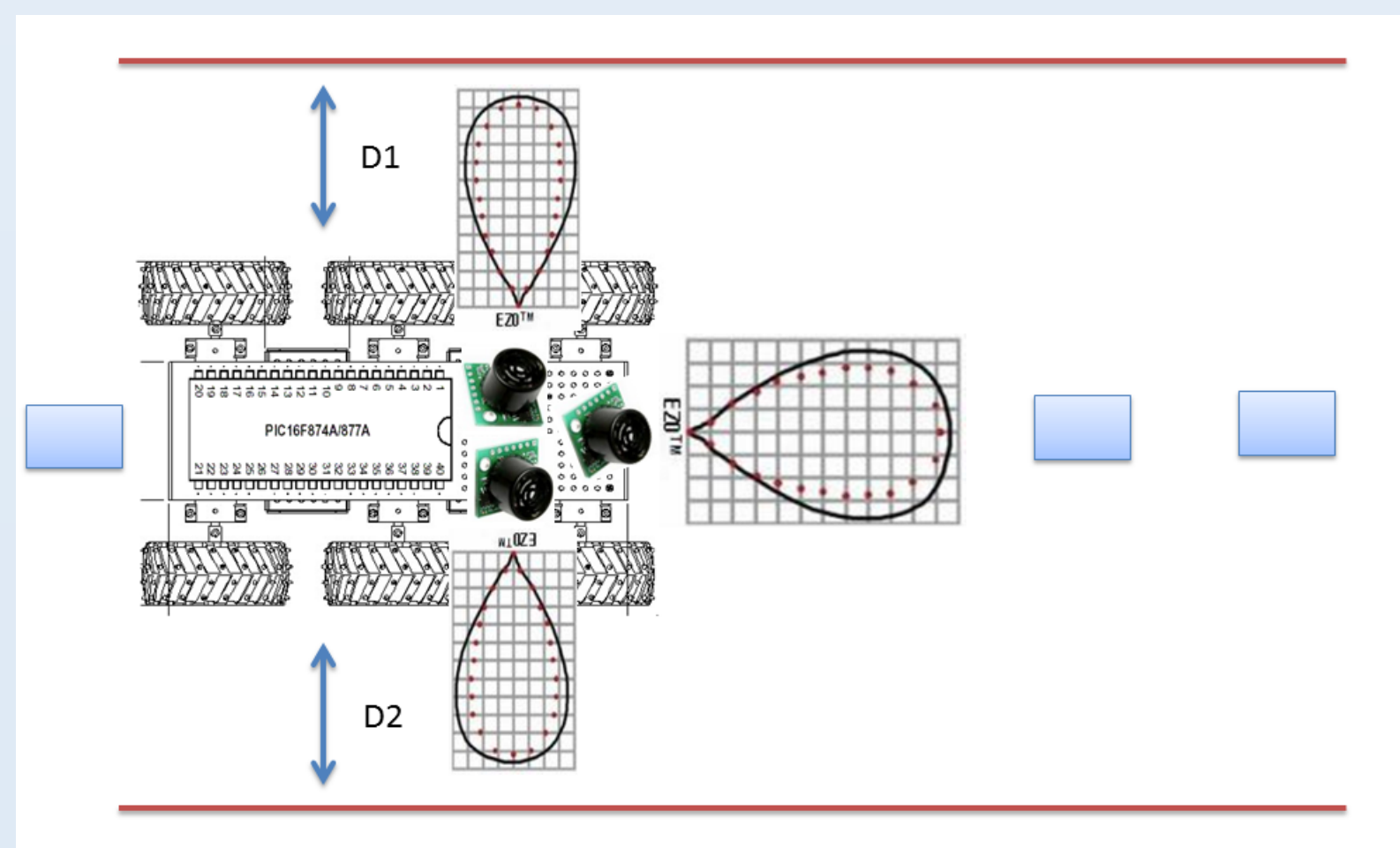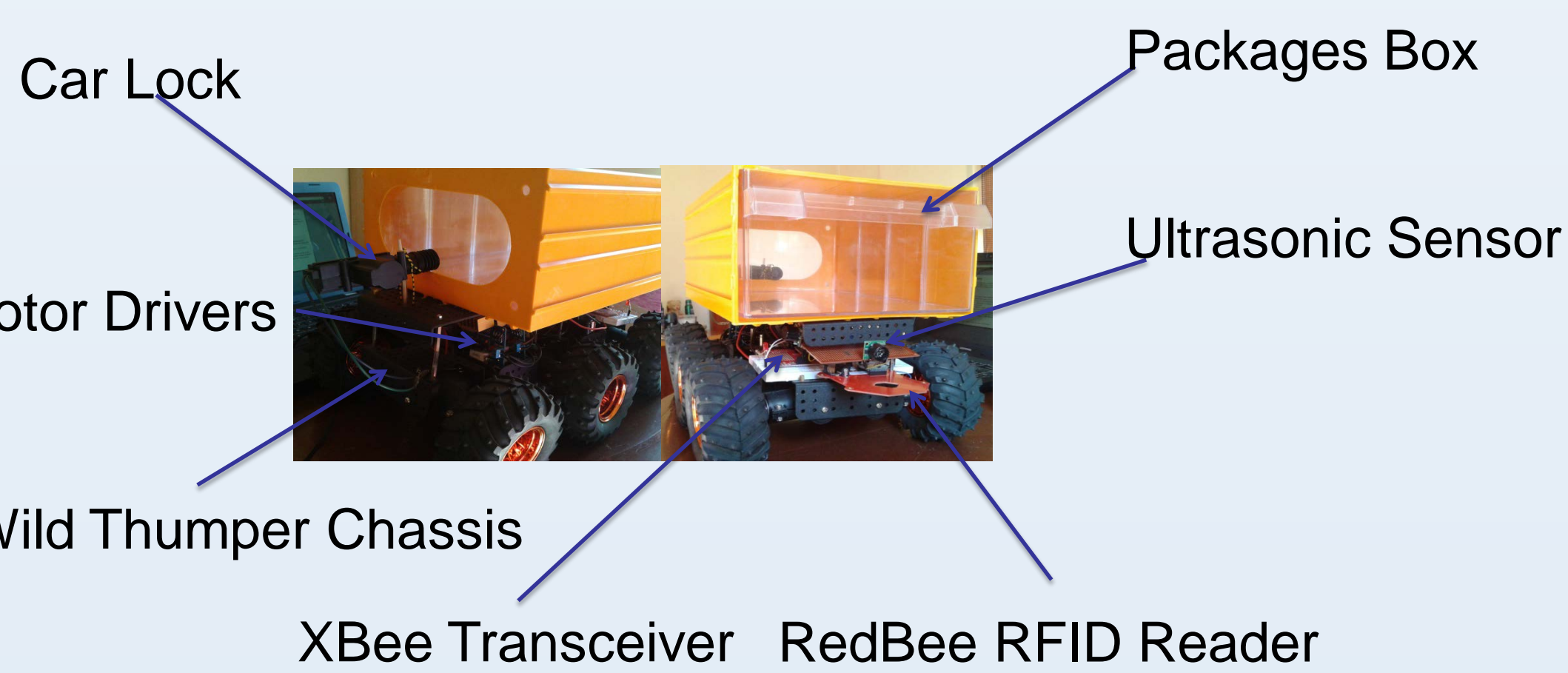*Capstone Design project I course (COE591)*

♦ Abstract

In this project, our objective is to automate the post office delivery system by implementing a robot system capable of path recognition using RFID tags in order to deliver packages among offices inside a company or university, which will be controlled wirelessly through a graphical user interface and configured via a mobile application.
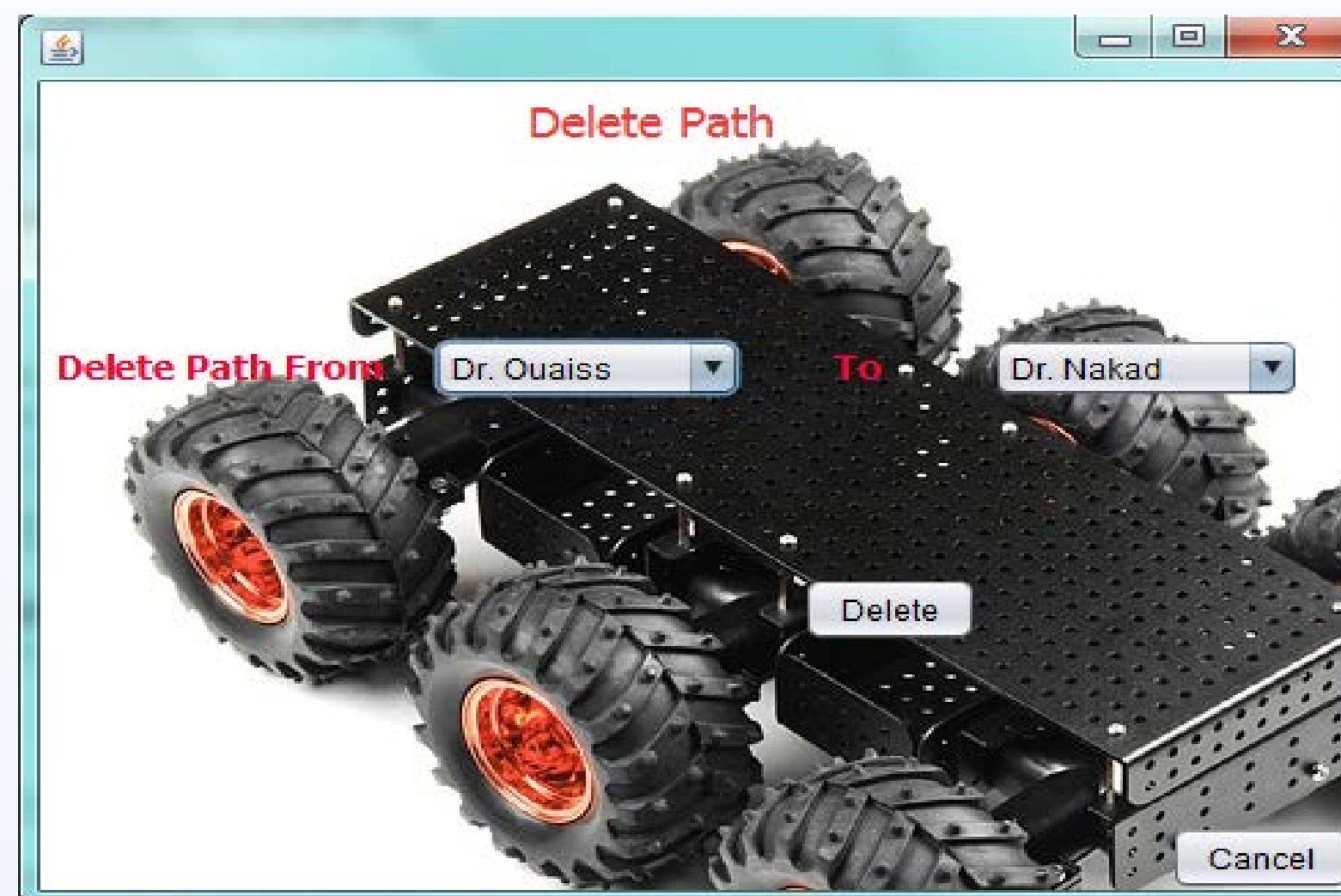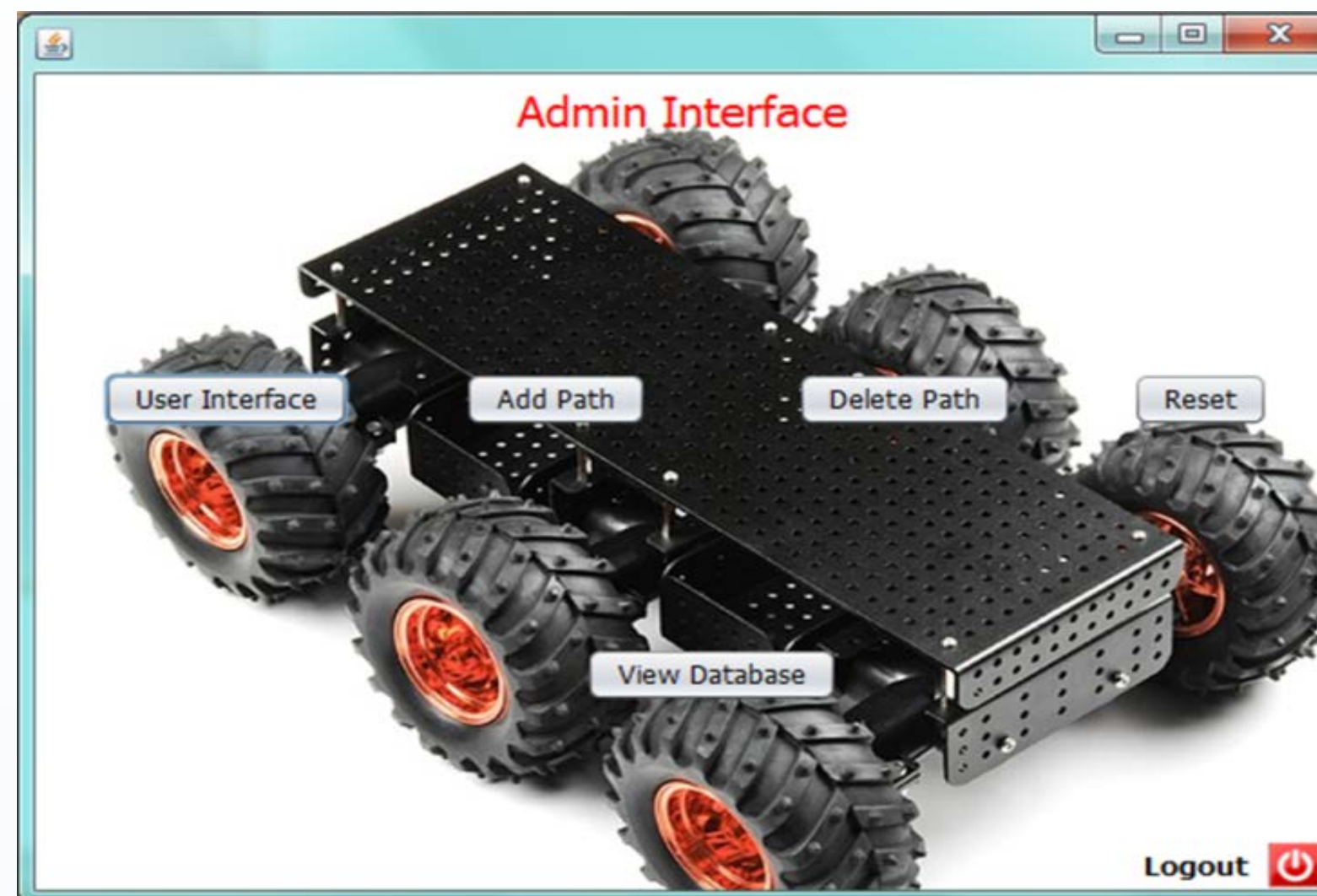
♦ Design

Following its path from the source to destination, the robot should avoid any obstacle that interrupts his way. However, since the robot follows a predefined path that is based on the tags map, the robot cannot change his way and go around any obstacle. For this, the obstacle avoidance strategy that was followed is based on stopping the robot when an obstacle is found until the obstacle goes away; the robot continues his path normally. When the robot reaches its destination, it is recognized by the system hardware; it waits for the user to pass his ID in order for the box to open. After the destined user takes the packages, he/she can return to the user interface and send other packages to different destinations or he/she can pass his/her ID another time in order for the robot to go back to the source office.

Car Lock

Packages Box

Ultrasonic Sensor

Motor Drivers

Wild Thumper Chassis

XBee Transceiver   RedBee RFID Reader

♦ Configuring the AIOR

The Graphical User Interface offers administrators the ability to reconfigure paths of delivery by addition, deletion and resetting the database.


♦ Configuring using Mobile Application

♦ Controlling the AIOR

The AIOR offers its users the ability to be controlled through a cross-platform graphical user interface implemented using JAVA. The user interface allow its users access and control of the AIOR by specifying the source and destination; also it offers the ability of tracking its location and motion using the "Where Am I?" feature that uses the RFID tags map as an indoor positioning system.
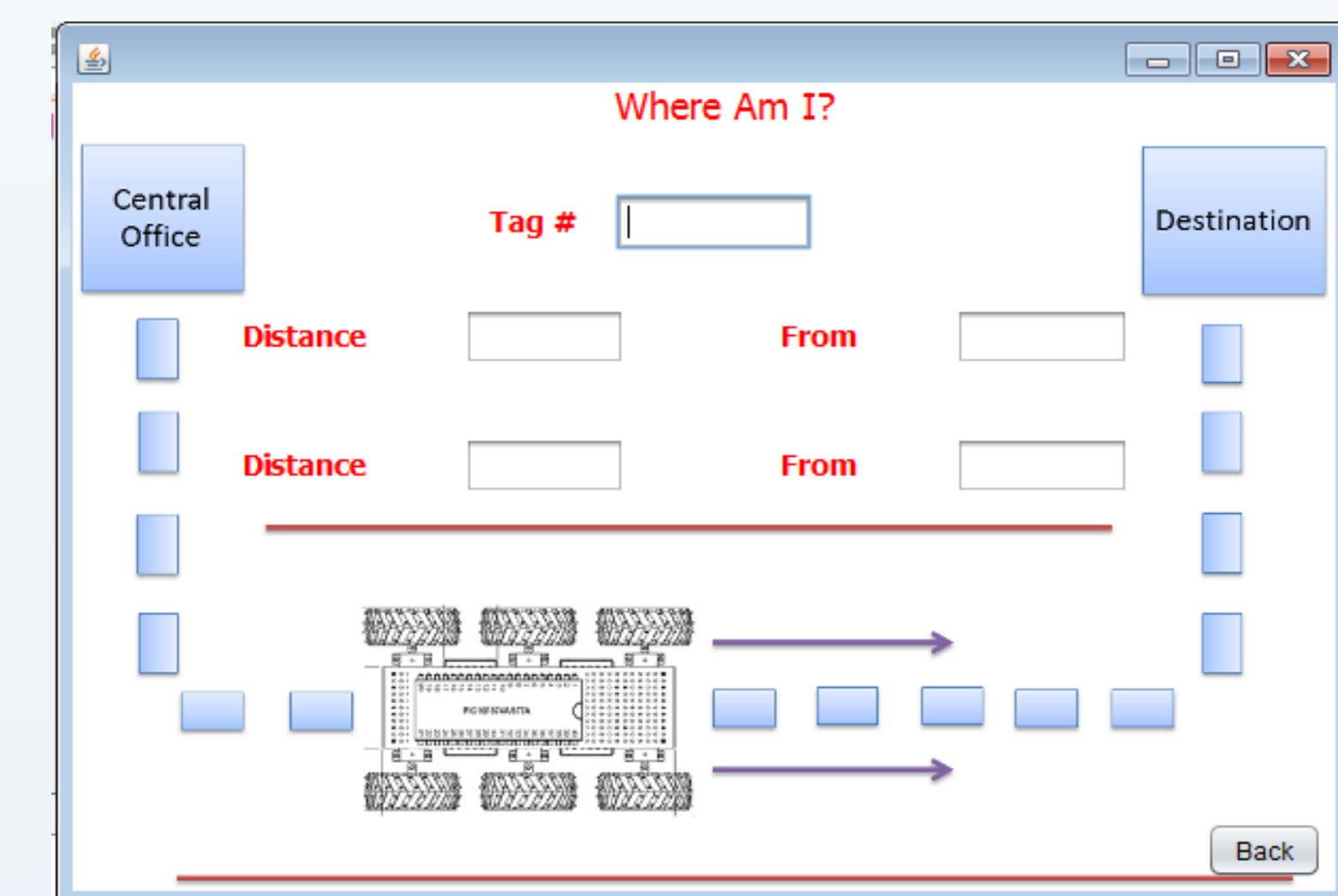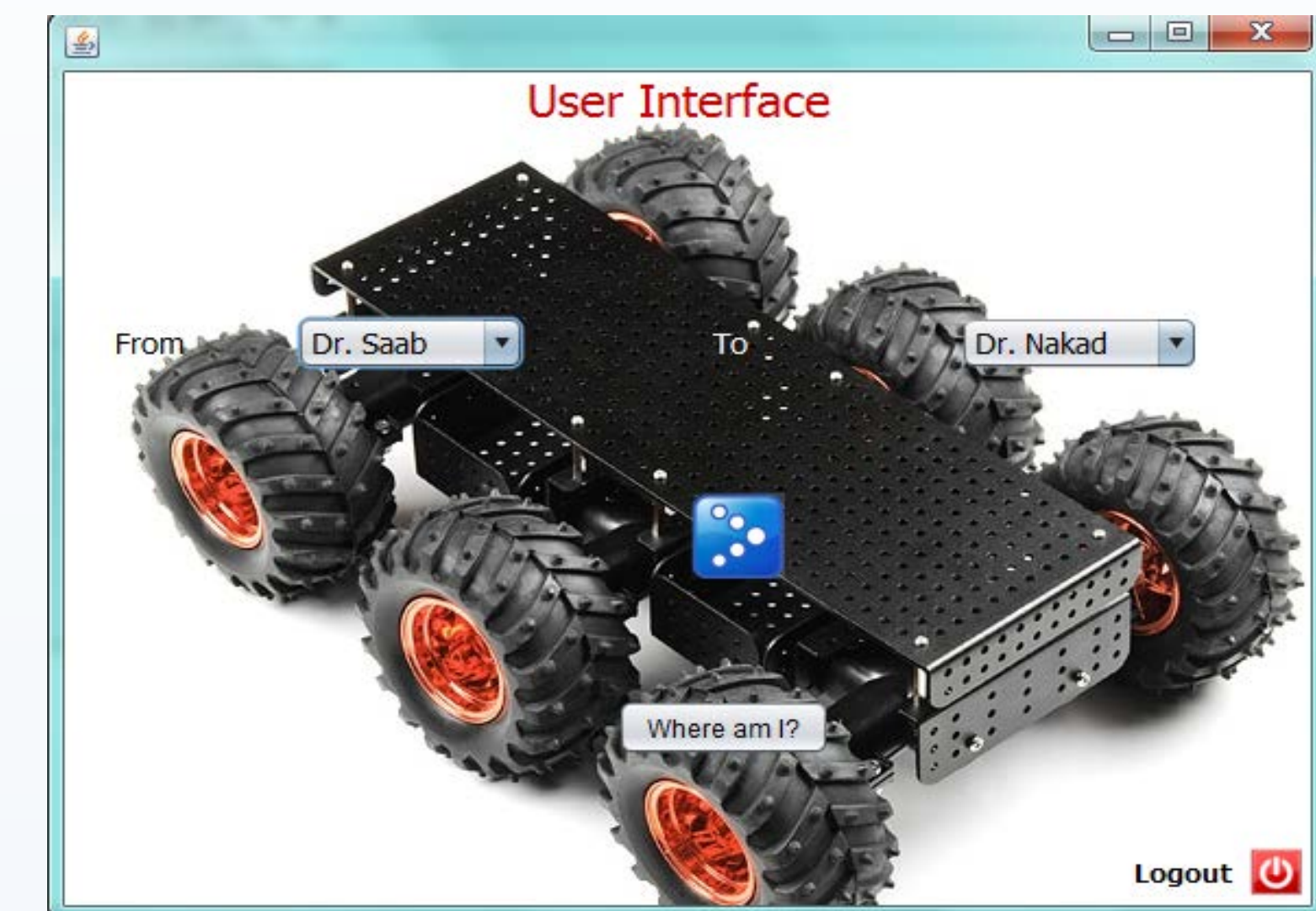
♦ Components & Materials

♦ Acknowledgements