

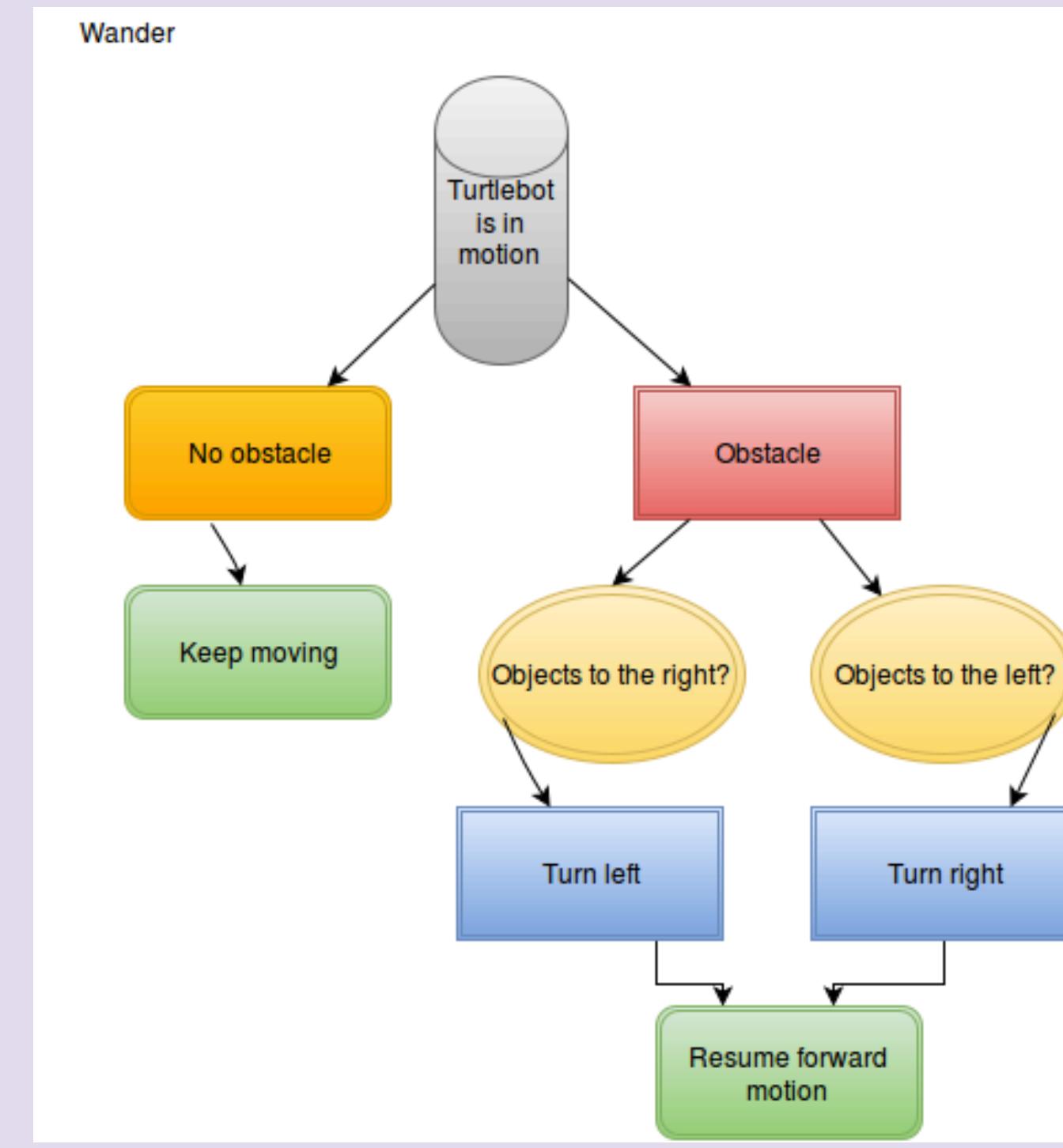
Sonny, Asimov's Dream

Sam Caldwell, Akash Surti Shannon Ehrnstein, Rollin Tschirgi

IMPLEMENTATION

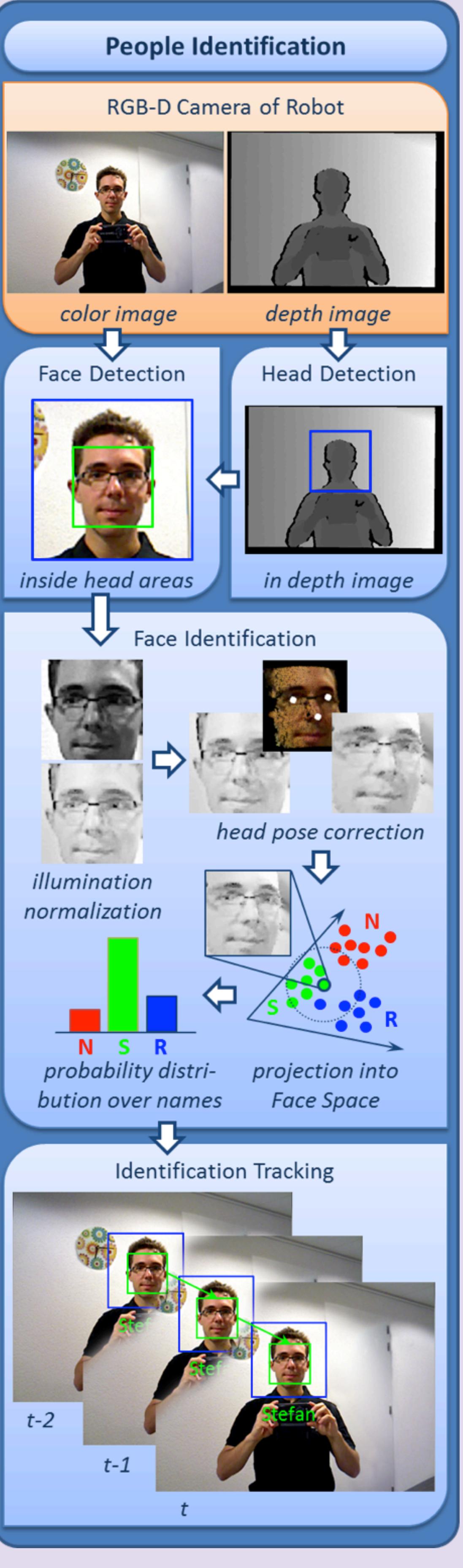
MOVEMENT

The robot's movement is designed so that it will not fall into a set pattern; instead it wanders until it reaches a wall or an object, then it turns in place for a set amount of time. The robot then moves in the new direction until reaching an obstacle. Coding the robot's movement this way prevents people from watching, seeing a pattern, and entering when the robot's "back" is turned.



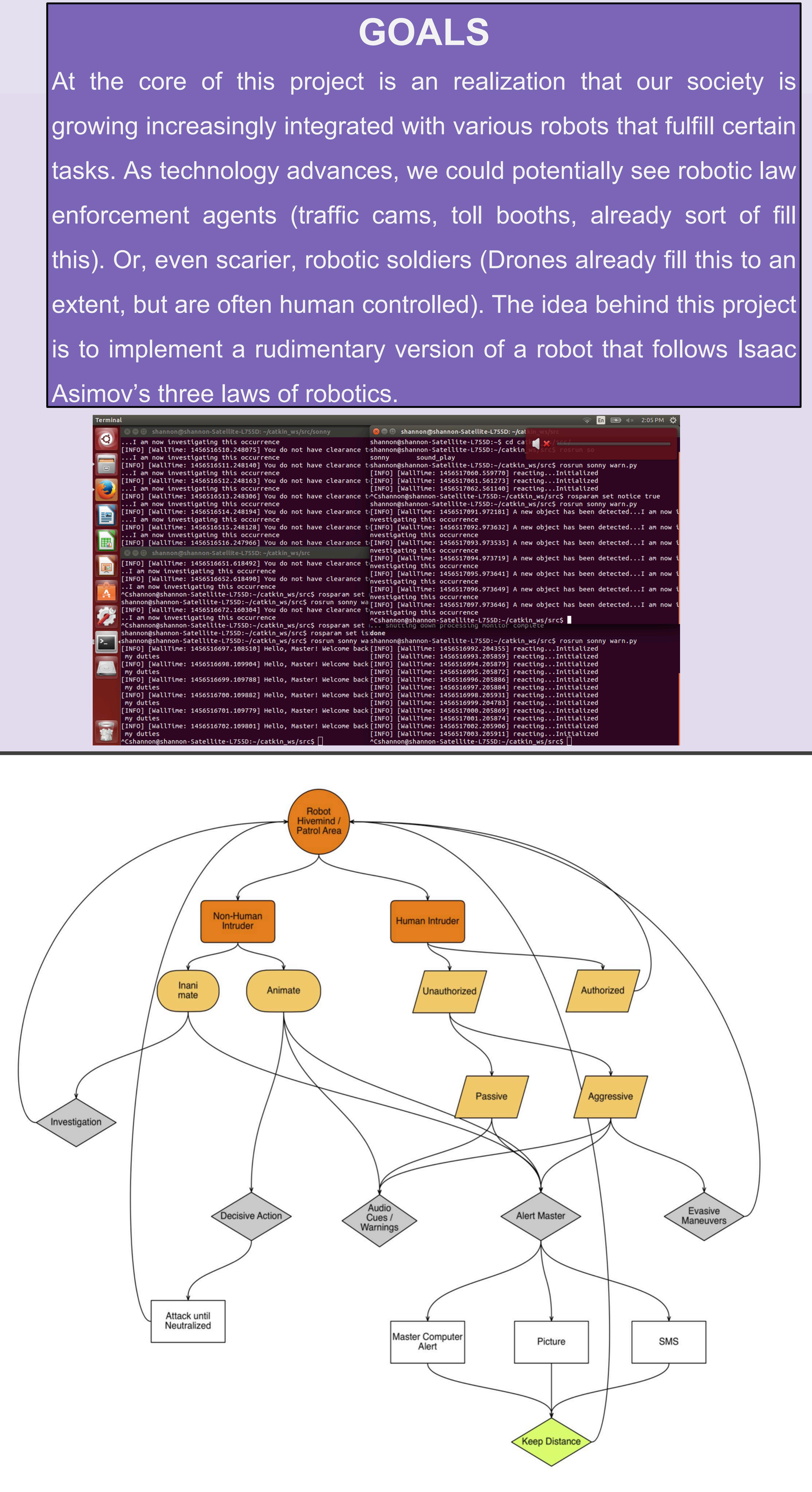
DETECTION

We will be using a combination of laser range data and video-based feature detection. When the laser takes a new scan, it compares it with the last scan, computing the absolute difference between each range measurement. The edges of large difference areas are marked and used to draw bounding boxes in the video feed. The image data from the box is checked for similarities to previously recognized objects. If it doesn't recognize the object, the data from the box will be used to form a new trackable object.



INTERACTION

When the robot notices a new person or object, it has several possible reactions. First, if they are human, the robot will attempt to identify them. A set group of people will be considered "authorized" and will be greeted and accepted. Those who are "unauthorized" will be warned to leave, and the robot will alert the master of their presence. When the intruder is not human, the robot will determine whether or not it is moving. Moving objects--such as other robots--are told to leave, and then it will attack them. Inanimate objects are noted, and the robot sends a message about their presence to the master.



ASIMOV'S THREE LAWS OF ROBOTICS

1. A ROBOT MAY NOT INJURE A HUMAN BEING OR, THROUGH INACTION, ALLOW A HUMAN BEING TO COME TO HARM.
2. A ROBOT MUST OBEY ORDERS GIVEN TO IT BY HUMAN BEINGS, EXCEPT WHERE SUCH ORDERS WOULD CONFLICT WITH THE FIRST LAW.
3. A ROBOT MUST PROTECT ITS OWN EXISTENCE AS LONG AS SUCH PROTECTION DOES NOT CONFLICT WITH THE FIRST OR SECOND LAW._

CHALLENGES

1. Integrating packages: people recognition with movement
2. Communication between nodes
3. integrating software and hardware: sensors and their data



RESULTS

We successfully implemented a wander code so that the robot would patrol without a set route. This allows for flexibility, as it will not be stopped by a sudden change in its environment. We also implemented code that allows the robot to communicate verbally with its local environment as well as sending messages to the master computer and detects people based upon their facial features.