MANT

CITS 1220
Group Project Overview
Group E

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Introducing the Mant

The Mant is an interactive robotic animal, designed to get high school students excited about Software Engineering. Built around a Lego NXT brick, the Mant is robust enough to be handled by students and can be demonstrated in almost any classroom environment.

The Mant has been designed to be demonstrated to upper-secondary school students. While students are the target audience, we suggest that an adult demonstrates the Mant. Students should interact with the Mant, but only under the supervision and direction of the demonstrator.

Physical Features
1. NXT Brick with buttons and LCD
2. Ultra-sonic sensor
3. Touch sensor
4. Light sensor
5. Independently driven wheels
6. Agile rear wheel

Behaviour and Operation

Using the Mant is fun and easy. Simply place him on a level surface, switch on the NXT Brick and run the Mant program.

The user is guided through a short calibration procedure when starting the Mant. The user should place the Light sensor section of the Mant over a supplied Poison zone and the floor when instructed.

The Mant is then free to roam the classroom landscape, avoiding obstacles with his Ultra-sonic sensor. At this stage the Mant is happy, has full health and moves quickly. He indicates his state with a smiling face and full health-bar on the LCD.

While he has full health the Mant is content exploring the room and does not like any unnecessary interaction with humans. Anyone who tries touching the Mant on his nose while he has full health will witness the Mant’s aggressive spin behaviour. During this display of aggression the LCD will show the Mant’s angry face.

The demonstrator should now place a Poison zone on the ground and allow the Mant to drive over it. As soon as the Mant has encountered the Poison his health level will drop. He will move slower, his face will become sad and the health-bar will drop. Each Poison zone the Mant finds will make him progressively sicker, slower and sadder.

Health zones can be used to restore health to a sick Mant. Allowing the Mant to drive over a Health zone will increase his health, let him move faster and improve his mood. The Mant will emit a short beep when he finds a Health zone.
Health zones, just like Poison zones, can be combined for a greater effect. Health zones have no effect on a fully fit Mant.

A more effective way of cheering up a sick Mant is to touch his nose. While this would normally agitate a healthy Mant, a sick Mant finds it invigorating. The Mant will immediately be restored to full health and will enter a hyperactive energised state. The Mant will beep and move at high speed for a few seconds while his LCD face displays his euphoric mood.

If a sick Mant doesn't find any Health zones and is not touched on the nose, he will automatically recover to full health after approximately 30 seconds from his first Poison encounter.

The Mant can be put to sleep at any time. Just press the rectangular grey button on the NXT Brick and he will immediately stop whatever he is doing. The Mant may be awoken by pressing any button on the NXT Brick.

The Mant’s Behaviours and Reactions

<table>
<thead>
<tr>
<th>State</th>
<th>Get Poison</th>
<th>Get Health</th>
<th>Touch Nose</th>
<th>Sense Obstacle</th>
<th>Touch Grey Button</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agitated</td>
<td></td>
<td>Less Health</td>
<td>Less Speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energised</td>
<td>Less Health</td>
<td>Less Speed</td>
<td>More Health</td>
<td>Become Agitated</td>
<td></td>
</tr>
<tr>
<td>Full Health</td>
<td>Less Health</td>
<td>Less Speed</td>
<td>More Health</td>
<td>Become Energised</td>
<td>Sleep</td>
</tr>
<tr>
<td>Mid Health</td>
<td>Less Health</td>
<td>Less Speed</td>
<td>More Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Health</td>
<td>Less Health</td>
<td>Less Speed</td>
<td>More Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asleep</td>
<td>Less Health</td>
<td>Less Speed</td>
<td>More Health</td>
<td></td>
<td>Wake</td>
</tr>
</tbody>
</table>

Information Display

In addition to displaying the Mant’s facial expressions (1) and health bar (2), the LCD shows the Mant’s beating heart (3), Ultra-sonic status (4) and battery level (5). If the Ultra-sonic icon is not displayed the Mant’s Ultra-sonic sensor has been deactivated. Press the left-arrow button on the NXT Brick to toggle the Ultra-sonic sensor on and off.

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