RVC Example.

Software Engineering #1

by B.J., Jesse and Eddy

Page 23: DFD Level 0

The first diagram shows the overall sensors that are required for the RVC to function. The RVC contains three direction/motion sensors and one dust sensor. These transmit information to the RVC control that then transmit the calculated output to the cleaner and the motor.

The digital clock controls the time factor that the control is build up around. The beat of the beast = Control flow.

Page 24: Data dictionary

Shows all inputs, outputs and events that can occur in the RVC, along with a list of descriptions about the individual components. In the sheet the digital clock is missing, which should also be added for the dictionary to be complete. The column on the far right explains the different states that the inputs can have.

Page 25: DFD Level 1

The diagram shows us a scenario that the RVC can experience. It detects and calculates regarding an obstacle and dusts every tick. The data comes from the four sensors (front, left, right and dust). It then transmits this calculated information to the cleaner and motor control, which translates this data into an action. The tick should also be applied to the cleaner and motor controller as a control flow.

Page 26: DFD Level 2

Here we go further into details on the first data process from level 1. Here each input from the sensors goes to the data process of each sensor interface, the translated data then goes to a data process, which handles the determination of obstacles in the vicinity. The dust sensor now has its own separate data flow through the system. Again we are missing a tick at the Front sensor interface.

Page 27: DFD Level 2

This is the second part of the data processing in DFD Level 1. Because of the new handling of data from page 26, there are two data stores entering the main control, these being obstacle location and dust existence.

The main control transmit data to the motor and cleaner interface. Which in turn sends this to the motor and cleaner to tell the RVC what to do. The whole thing is still controlled by the tick.

The main control should be a control process.

Page 28: DFD Level 3

The level of detail is once again heighten to be able to see the exact functions of each set of data. The diagram only shows the motor interface and the actions that is available from each of the sensor data that was inserted in the controller. The orders that the controller can give the various actions are shown in the diagram.

The cleaner interface is missing, or at least not sufficiently described. The cleaner command should be a data process and the arrow from the controller to the cleaner command should be a control flow. The output of the cleaner command should be the same as the other actions. The orders missing for the cleaner is on/off/up.

Page 29: DFD Level 4

Commands:

! = No.

F = Obstacle in front of RVC.

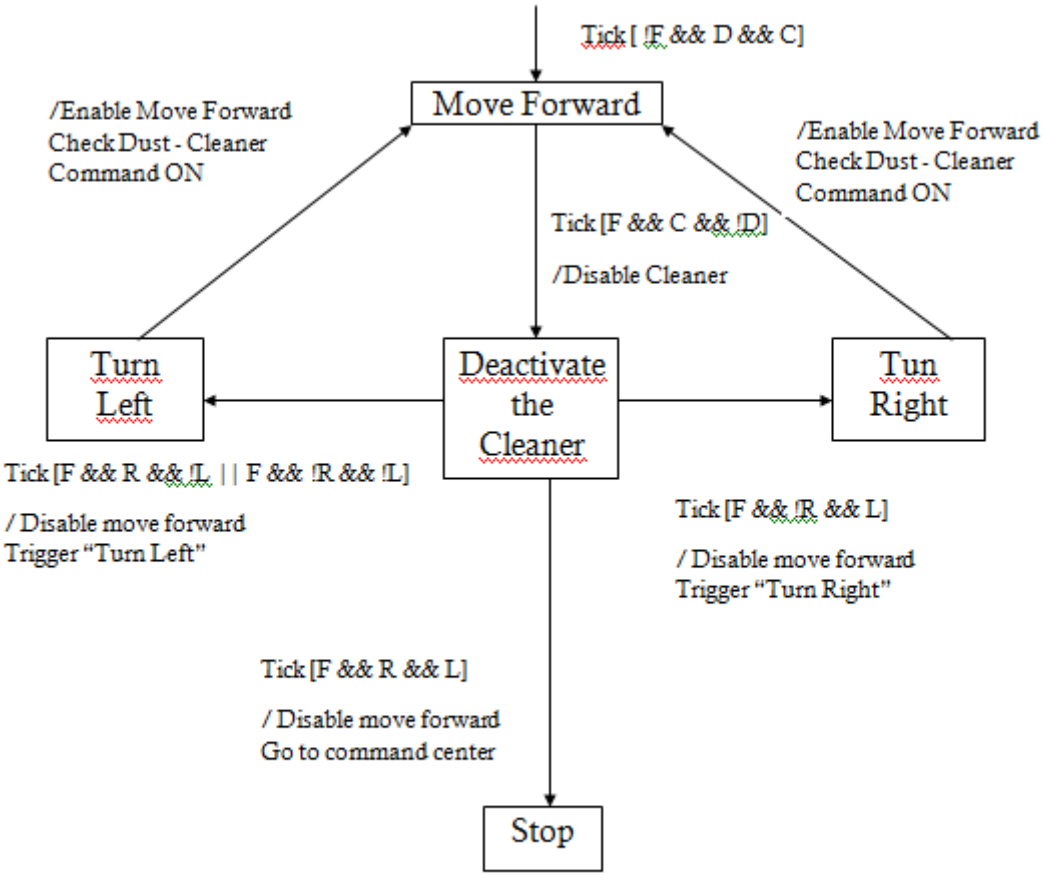
R = Turn right.

L = Turn left.

&& = Finish condition.

D = Detection of dust.

C = Cleaner on.



Comments:

- We chose to have it going left as a first priority and if it can't go left it chooses right.
- Stop state makes the RVC return to base. We considered backing out and turning again, but didn't know the limits of actions.