Chapter 3

Composite System Overview

This composite system was developed, specific to be implemented in Scorpion Robot. The purpose of this implementation was to control the movement behavior of Scorpion Robot, based on fuzzy perception of mapped obstacles. The complete subsystem was organized as configuration in Figure 3.1. There are four basic subsystems of ERSP: Sensor, Odometry, DoubleArraySplitter and DriveSystem (shown in gray color); and there are six developed subsystems: Build-Map, Odo-Map, Check-Region, Command, Add-Image and Movement. Data flows from left to right. Sensors are the first subsystems and DriveSystem is the last subsystem. Port in the left side of the subsystem is input port, and port in the right side of the subsystem is output port.

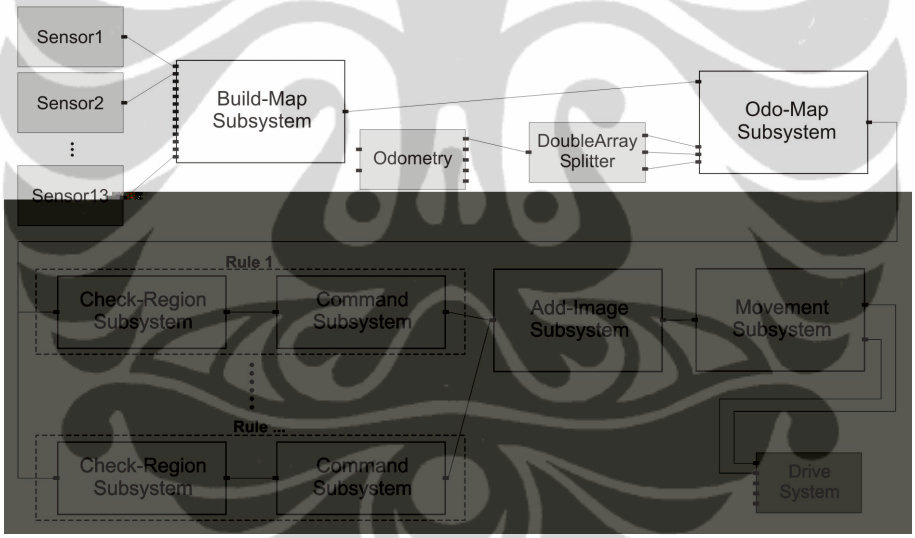

Figure 3.1: Composite System Configuration

ERSP Subsystem

Sensors provided distance measurements of obstacle. Odometry provided resources of current robot position and heading. DoubleArraySplitter was used to split a double array into set of doubles. DriveSystem controlled the linear and angular movement of the robot.

Implemented Subsystem

Build-Map subsystem produced a map of obstacle based on the measurement of sensors. Odo-Map subsystem rotated and translated a map based on current odometry information of the robot. Check-Region subsystem determined an obstacle density in a specific region. Command subsystem applied a movement command based on input from Check-Region subsystem. When there were more than one rule, Add-Image subsystem combined all movement commands into a single image. Movement subsystem calculated the centroid of combined commands and sent the result to DriveSystem.

A more detailed of composite system implementation and experiments are described the next chapters.