

# DEVELOPING WF ROBOT USING ADAPTIVE LEARNING RATE BACKPROPAGATION IN WEBOTS®

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## ABSTRACT

*Wall Follower (WF) Robot must have more than 1 sonar ranging sensors. We can not control the robot smoothly with only a switching control. Some researcher tried to implement a Fuzzy Logic as a navigation control. In Fuzzy Logic control, they test the FLC parameters several time to make sure that the model has an optimum navigation control. In this paper, navigation control of WF robot is set to use a Neural Network based on Adaptive Learning Rate Back Propagation. We have developed a learning algorithm using ALRBP. This WF robot was created in Webots simulator environment which has completed all physics conditions. Although it was a robot simulator it provided a real world conditions. We have trained the WF robot without a cylindric shape obstacle. For the running process, we provided 2 conditions, without an obstacle and with some obstacles. The result was a 100% success. WF robot could do 10 laps smoothly with minimum oscillations in Webots field without any obstacle. In the case of WF robot that gets a training without obstacles, we still got good results of 80% success. This concludes that ALRBP can help a WF robot to move smoothly and handle a blank spot of Neural Network training.*

**Keywords:** *WF Robot, Sonar Ranging Sensors, Neural Network, Adaptive Learning Rate Back Propagation, Webots®.*