Abstract

Traffic congestion has become a common scenario in today's day to day experience and
Design and Implementation of an Embedded System for Fuzzy Logic based Traffic Light Controller

this can be owed to the fact that most of the junctions using conventional crisp Traffic light controllers. Fuzzy Logic the basis of Soft computing can be considered to be the superset of the Crisp Logic which takes into account the whole spectrum of possibilities. Fuzzy Logic best handles the uncertainty in the inputs and can give best possible outcomes compared to Aristotelian logic. It also has an upper hand as it gives the system a human like thinking. If Fuzzy logic can be applied to conventional traffic controlling one can see the dynamic control of the same. Furthermore fuzzy logic makes the system adaptable and intelligent as it can best handle the irregularities in the input. This paper focuses on the design and implementation of an Embedded System for Fuzzy Logic based Traffic Light Controller (TLC) using VHDL which includes the implementation of Fuzzifier, Fuzzy Inference Engine and the Defuzzifier on FPGA using VHDL. The simulations have been carried out using ModelSim 6.1 simulator and synthesis has been carried out using Xilinx XST. The implementation is done on Spartan xc3s400-5pq208 FPGA and a maximum Frequency of 487.936MHz is obtained.

Referen
ces

- Timothy Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill Publications,
- Li Xin Wang, &quot;A Course in Fuzzy Systems and Control&quot;, Prentice Hall International.
- Wu Wei and Yi Zhang, &quot; FL-FN Based Traffic Signal Control&quot;,
0-7803-7280-8/02/$10. 00, 2002 IEEE Transaction.
- Mohamed Slim Masmoudi, In sop Song, Fakhreddine Karray, Mohamed Masmoudi, Nabil Derbel, HARDWARE/ SOFTWARE APPROACH FOR THE FPGA IMPLEMENTATION OF A FUZZY LOGIC CONTROLLER 0-7803-9727-4/06 2006 IEEE.

Index Terms

Computer Science

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