ABSTRACT

Microprocessors are much important part of computers and IoT. Along with changing times and technological systems, the microprocessor also develops according to technology needs. In technology needs, the microprocessor is a tool to help the performance in the system on that technology. Technology requires a microprocessor because the microprocessor has components to produce output according to the commands given to the microprocessor.

In the previous microprocessor design, the microprocessor has designed to run a computer or technological device that requires a large memory capacity to store data and commands on the microprocessor. Along with the excessive of using are memory and commands, the microprocessor suffers from a decrease in performance which causes the microprocessor to overkill. Overkill is a problem when the microprocessor experiences a performance slowdown due to the large number of commands and memory that the microprocessor receives. Overkill on the microprocessor also occurs because there are too many bits, so the microprocessor is no longer relevant in improving its performance.

One way to solve the problem with the microprocessor is to design a simple microprocessor that requires memory capacity and commands that can accommodate the microprocessor. To overcome this solution, this research design a microprocessor with an instruction set processor (ASIP) using Huffman coding so that the microprocessor can work according to the instructions ordered. The method used in designing this microprocessor uses software, namely Altera Quartus with Verilog HDL programming language. The application serves to designs the microprocessor designing, the system will be measured with system performance parameters to determine the memory capacity of the microprocessor in the presence of accommodated instructions.

From the measurement results, it was found that the microprocessor design had a spared element capacity of 6272 elements more than the intel 8088 microprocessor, based on the parameters from the measurement results in the analysis and synthesis in Altera Quartus. With the measurement results, the design of this microprocessor can accommodate the instructions given from the Huffman coding so that the resulting bits do not exceed the required capacity. This thesis is a continuation of Nimas's Sekar Fatihah Thesis is discusses Huffman coding. From designing this microprocessor, hoping the use of a simpler and more efficient microprocessor could be used so it can reduce excessive microprocessor performance. Keywords: Microprocessor, Altera Quartus, Verilog HDL, ASIP, Huffman Coding.