SENSOR SYSTEM FOR AN ARTIFICIAL HAND

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Abstract: This paper presents a flexible digital design platform for the implementation of a Sensor System for an Artificial Hand using reconfigurable devices (FPGA) and a microcontroler. The purpose is to develop systems for artificial sensibility to be applied to hand prostheses and to patients with loss of sensory nerve function. The use of Artificial Neural Network (ANN) is essential to fulfill this purpose. This platform was developed in order to provide a fast prototyping environment. The microcontroler is used to implement the software part of a given application, and the reconfigurable device (XC4010XL FPGA- Xilinx) to implement the hardware part of the same application. The neural network is described using VHDL language, and Xilinx ISE4.2 software was used to implement it, in FPGA. By exploiting the easy reconfiguration capabilities of FPGA devices it is possible to implement many type of ANN. Using a Data Acquisition System and acquisition software the system provide an easy way to observe the results.

Key words: Neural Network, Hardware Implementation, Field Programmable Gate Arrays, Sensor System, Artificial Hand.

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