

Indoor Positioning Using Artificial Neural Network with Field Programmable Gate Array Implementation

Syahrulanuar Ngah, Rohani Abu Bakar, Suryanti Awang

Faculty of System Computer & Software Engineering, Universiti Malaysia Pahang,
Lebuhraya Tun Razak, jalan Gambang,
26300 Kuantan Pahang, Malaysia

Indoor positioning required fast and accurate result. This paper applied the artificial neural network (ANN) as a system for calculating the target in indoor environment. To speed up the calculation time, ANN then is run into field programmable gate array (FPGA). Since the original sigmoid function in ANN is not feasible to be applied into FPGA, two-steps sigmoid function calculation proposed by previous researcher then is used as a replacement. A new design of the FPGA is proposed to suite the requirement for implementing the previous researcher method. The results showing that FPGA can calculate 20 times faster with the maximum error 0.04 meters, slightly higher than the software implementation.

Keywords: Artificial neural network, field programmable gate array and indoor positioning