Implementation of Sensor Fusion Structure of 9-Axis Sensors on the Multipoint Control Unit

Authors : Jun Gil Ahn, Jong Tae Kim

Abstract : In this paper, we study the sensor fusion structure on the multipoint control unit (MCU). Sensor fusion using Kalman filter for 9-axis sensors is considered. The 9-axis inertial sensor is the combination of 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer. We implement the sensor fusion structure among the sensor hubs in MCU and measure the execution time, power consumptions, and total energy. Experiments with real data from 9-axis sensor in 20Mhz show that the average power consumptions are 44mW and 48mW on Cortx-M0 and Cortex-M3 MCU, respectively. Execution times are 613.03 us and 305.6 us respectively.

Keywords : 9-axis sensor, Kalman filter, MCU, sensor fusion

Conference Title : ICECECE 2017 : International Conference on Electrical, Computer, Electronics and Communication Engineering

Conference Location : San Diego, United States

Conference Dates : December 18-19, 2017