# A magnetic field correction method for the non-ideally placed 3-axial magnetometer sensor

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Abstract: There is an error when measuring the objective magnetic field by the non-ideally placed 3-axial magnetometer sensor, and for many cases the sensor can't be ensured to be placed ideally due to various reasons. To solve the problem, 3 equivalent pose angles (α, β and γ) are taken to represent the sensor's non-ideal pose and to found a transform matrix to correct the measured value of the magnetic field. As the unique solution of the pose angles can't be gotten only by the local geomagnetic field, a known accessorial magnetic field is added to form the second background field. Based on the measured values of the 2 background fields by the sensor at ideal and non-ideal poses, the pose angles can be calculated by PSO algorithm, and then the measured value of the objective field can be corrected by the transform matrix. The experiment results of the 2 randomly chosen sensors have shown that the correcting value of the non-ideally placed sensor corrected by this method is very close to the actual value of the objective field, and it can satisfy the demands of the engineering. 

Author Keywords: 3-axial magnetometer sensor; Magnetic field correction; Pose angle; PSO algorithm; Transform matrix

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