

Tape-Shaped Multiscale Fiducial Marker: A Design Prototype for Indoor Localization

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Abstract : Indoor positioning systems use sensors such as Bluetooth, ZigBee, and Wi-Fi, as well as cameras for image capture, which can be fixed or mobile. These computer vision-based positioning approaches are low-cost to implement, mainly when it uses a mobile camera. The present study aims to create a design of a fiducial marker for a low-cost indoor localization system. The marker is tape-shaped to perform a continuous reading employing two detection algorithms, one for greater distances and another for smaller distances. Therefore, the location service is always operational, even with variations in capture distance. A minimal localization and reading algorithm were implemented for the proposed marker design, aiming to validate it. The accuracy tests consider readings varying the capture distance between [0.5, 10] meters, comparing the proposed marker with others. The tests showed that the proposed marker has a broader capture range than the ArUco and QRCode, maintaining the same size. Therefore, reducing the visual pollution and maximizing the tracking since the ambient can be covered entirely.

Keywords : multiscale recognition, indoor localization, tape-shaped marker, fiducial marker

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