Robust Tracking Through the Design of High Quality Fiducial Markers: An Optimization Tool for ARToolKit

Titre	Robust Tracking Through the Design of High Quality Fiducial Markers: An Optimization Tool for ARToolKit
Type de publication	Article de revue
Auteur	Khan, Dawar [1], Ullah, Sehat [2], Yan, Dong Ming [3], Rabbi, Ihsan [4], Richard, Paul [5], Hoang, Thuong [6], Billinghurst, Mark [7], Zhang, Xiaopeng [8]
Editeur	Institute of Electrical and Electronics Engineers (IEEE)
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	8 Février 2018
Pagination	22421--22433
Volume	6
Titre de la revue	IEEE Access
ISSN	2169-3536
Mots-clés	ARToolKit [9], augmented reality [10], Fiducial markers [11], marker tracking [12], robust recognition [13]
Résumé en anglais	Fiducial markers are images or landmarks placed in real environment, typically used for pose estimation and camera tracking. Reliable fiducials are strongly desired for many augmented reality (AR) applications, but currently there is no systematic method to design highly reliable fiducials. In this paper, we present fiducial marker optimizer (FMO), a tool to optimize the design attributes of ARToolKit markers, including black to white (B:W) ratio, edge sharpness, and information complexity, and to reduce inter-marker confusion. For these operations, the FMO provides a user friendly interface at the front-end and specialized image processing algorithms at the back-end. We tested manually designed markers and FMO optimized markers in ARToolKit and found that the latter were more robust. The FMO will be used for designing highly reliable fiducials in easy to use fashion. It will improve the application's performance, where it is used.
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DOI	10.1109/ACCESS.2018.2801028 [15]
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