

Document details

[Back to results](#) | 1 of 1[Full Text](#)[View at Publisher](#)[Export](#)[Download](#)[Add to List](#) | [More...](#)

Jurnal Teknologi

Volume 78, Issue 9, 2016, Pages 185-193

Analysis and enhancement of the denoising depth data using kinect through iterative technique (Article)Karbasi, M.^a, Bilal, S.^a, Aghababaeyan, R.^b, Rad, A.E.^c, Bhatti, Z.^a, Shah, A.^a^a Khulliyah of Information and Communication Technology, International Islamic University Malaysia, Malaysia^b Department of Computer, Rodehen Branch, Islamic Azad University, Rodehen, Iran^c Department of Computer Engineering, Faculty of Computing, Universiti Teknologi Malaysia, (UTM), Johor Bahru, Johor, Malaysia[View additional affiliations](#)

Abstract

[View references \(29\)](#)

Since the release of **Kinect** by Microsoft, the accuracy and stability of **Kinect data**-such as **depth** map, has been essential and important element of research and **data analysis**. In order to develop efficient means of analyzing and using the kinect **data**, researchers require high quality of **depth data** during the preprocessing step, which is very crucial for accurate results. One of the most important concerns of researchers is to eliminate image noise and convert image and video to the best quality. In this paper, different types of the noise for **Kinect** are analyzed and a unique **technique** is used, to reduce the background noise based on distance between **Kinect** device and the user. Whereas, for shadow removal, the **iterative** method is used to eliminate the shadow casted by the **Kinect**. A 3D **depth** image is obtained as a result with good quality and accuracy. Further, the results of this present study reveal that the image background is eliminated completely and the 3D image quality in **depth** map has been enhanced. © 2016 Penerbit UTM Press. All rights reserved.

Author keywords

Denoising; **Depth** map; **Kinect** sensor; Types of noise

ISSN: 01279696 Source Type: Journal Original language: English

DOI: 10.11113/jt.v78.5348 Document Type: Article

Publisher: Penerbit UTM Press

References (29)

[View in search results format](#) All [Export](#) | [Print](#) | [E-mail](#) | [Save to PDF](#) | [Create bibliography](#) Andersen, M.R.1 (2012) *Kinect Depth Sensor Evaluation for Computer Vision Applications*. Cited 66 times. Arhus University Arbel, E., Hel-Or, H.2 [Shadow removal using intensity surfaces and texture anchor points](#)(2011) *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 33 (6), art. no. 5557880, pp. 1202-1216. Cited 43 times.

doi: 10.1109/TPAMI.2010.157

[View at Publisher](#) Arieli, Y.3 (2012) *Depth Mapping Using Projected Patterns, Google Patents*. Cited 140 times. Barnich, O., Van Droogenbroeck, M.

4

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert](#)[Set citation feed](#)

Related documents

Characterizations of noise in Kinect depth images: A reviewMallick, T., Das, P.P., Majumdar, A.K. (2014) *IEEE Sensors Journal***Kinect unbiased**Martinez, M., Stiefelagen, R. (2014) *2014 IEEE International Conference on Image Processing, ICIP 2014***Deterioration of depth measurements due to interference of multiple RGB-D sensors**Martin Martin, R., Lorbach, M., Brock, O. (2014) *IEEE International Conference on Intelligent Robots and Systems*[View all related documents based on references](#)

Find more related documents in Scopus based on:

[Authors](#)[Keywords](#)

Metrics

3

Mendeley Readers

40TH PERCENTILE

[View all metrics](#)

VIBE: A powerful random technique to estimate the background in video sequences

(2009) *ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings*, art. no. 4959741, pp. 945-948. Cited 156 times.

ISBN: 978-142442354-5

doi: 10.1109/ICASSP.2009.4959741

[View at Publisher](#)

- Barnich, O., Van Droogenbroeck, M.

5 **VIBe: A universal background subtraction algorithm for video sequences**

(2011) *IEEE Transactions on Image Processing*, 20 (6), art. no. 5672785, pp. 1709-1724. Cited 558 times.

doi: 10.1109/TIP.2010.2101613

[View at Publisher](#)

- Dakkak, A., Husain, A.

- 6 (2012) *Recovering Missing Depth Information from Microsoft's Kinect*
Carnegie Mellon University's

- Danciu, G.

- 7 Shadow Removal In Depth Images Morphology-Based For Kinect Cameras
(2012) *System Theory, 16Th International Conference On*, p. 2012.
IEEE, Control and Computing (ICSTCC)

- Essmaeel, K., Gallo, L., Damiani, E., De Pietro, G., Dipandà, A.

8 **Temporal denoising of Kinect depth data**

(2012) *8th International Conference on Signal Image Technology and Internet Based Systems, SITIS 2012r*, art. no. 6395072, pp. 47-52. Cited 25 times.

ISBN: 978-076954911-8

doi: 10.1109/SITIS.2012.18

[View at Publisher](#)

- Faion, F.

- 9 Intelligent sensor-scheduling for multi-kinect-tracking
(2012) *International Conference On, IEEE, Intelligent Robots and Systems (IROS), 2012 IEEE/RSJ*

- Fu, J.

- 10 Kinect-like Depth Denoising. Circuits and Systems (ISCAS)
(2012) *2012 IEEE International Symposium On, IEEE*

- Hsieha, C.-F.

- 11 (2014) *An Improved Depth Image in Painting*

- Hu, W., Li, X., Cheung, G., Au, O.

12 **Depth map denoising using graph-based transform and group sparsity**

(2013) *2013 IEEE International Workshop on Multimedia Signal Processing, MMSP 2013*, art. no. 6659254, pp. 1-6. Cited 12 times.

ISBN: 978-147990125-8

doi: 10.1109/MMSP.2013.6659254

[View at Publisher](#)

- Kean, S.

- 13 (2011) *Meet the Kinect: An Introduction to Programming Natural User Interfaces*. Cited 18 times.
Apress

- Khoshelham, K.

- 14 Accuracy Analysis Of Kinect Depth Data
(2011) *ISPRS Workshop Laser Scanning*

- Khoshelham, K., Elberink, S.O.

15

Accuracy and resolution of kinect depth data for indoor mapping applications(2012) *Sensors*, 12 (2), pp. 1437-1454. Cited 689 times.<http://www.mdpi.com/1424-8220/12/2/1437/pdf>

doi: 10.3390/s120201437

[View at Publisher](#)

- Leens, J., Piérard, S., Barnich, O., Van Droogenbroeck, M., Wagner, J.-M.

16 Combining color, depth, and motion for video segmentation(2009) *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 5815 LNCS, pp. 104-113. Cited 29 times.

ISBN: 3642046665; 978-364204666-7

doi: 10.1007/978-3-642-04667-4_11

[View at Publisher](#)

- Liu, J., Gong, X., Liu, J.

17 Guided inpainting and filtering for Kinect depth maps(2012) *Proceedings - International Conference on Pattern Recognition*, art. no. 6460564, pp. 2055-2058. Cited 28 times.

ISBN: 978-499064410-9

- Liu, S.

18 Kinect Depth In painting via Graph Laplacian with TV21 Regularization(2013) *2Nd IAPR Asian Conference On, IEEE., Pattern Recognition (ACPR), 2013*

- Matyunin, S., Vatolin, D., Berdnikov, Y., Smirnov, M.

19 Temporal filtering for depth maps generated by Kinect depth camera(2011) *3DTV Conference: The True Vision - Capture, Transmission and Display of 3D Video, 3DTV-CON 2011 - Proceedings*, art. no. 5877202. Cited 2 times.

ISBN: 978-161284162-5

doi: 10.1109/3DTV.2011.5877202

[View at Publisher](#)

- Milani, S., Calvagno, G.

20 Joint Denoising And Interpolation Of Depth Maps For MS Kinect Sensors(2012) *Acoustics, 2012 IEEE International Conference On, IEEE., Speech and Signal Processing (ICASSP)*

- Mueller, M.

21 Adaptive cross-trilateral depth map filtering. 3DTV-Conference: The True Vision-Capture(2010) *Transmission and Display of 3D Video (3DTV-CON), 2010, IEEE*

- Nguyen, C.V., Izadi, S., Lovell, D.

22 Modeling kinect sensor noise for improved 3D reconstruction and tracking(2012) *Proceedings - 2nd Joint 3DIM/3DPVT Conference: 3D Imaging, Modeling, Processing, Visualization and Transmission, 3DIMPVT 2012*, art. no. 6375037, pp. 524-530. Cited 88 times.

ISBN: 978-076954873-9

doi: 10.1109/3DIMPVT.2012.84

[View at Publisher](#)

- Park, J.-H., Shin, Y.-D., Bae, J.-H., Baeg, M.-H.

23 Spatial uncertainty model for visual features using a Kinect™ sensor(2012) *Sensors (Switzerland)*, 12 (7), pp. 8640-8662. Cited 31 times.<http://www.mdpi.com/1424-8220/12/7/8640/pdf>

doi: 10.3390/s120708640

[View at Publisher](#)

- Qi, F., Han, J., Wang, P., Shi, G., Li, F.

24 Structure guided fusion for depth map inpainting(2013) *Pattern Recognition Letters*, 34 (1), pp. 70-76. Cited 43 times.

doi: 10.1016/j.patrec.2012.06.003

[View at Publisher](#)

- Tallón, M.
25 Up Sampling And Denoising Of Depth Maps Via Joint-Segmentation
(2012) *Proceedings of the 20Th European, IEEE., Signal Processing Conference (EUSIPCO), 2012*
- Xiao, Y.
26 *Shadow Removal from Single RGB-D Images*
- Xiong, H., Pandey, G., Steinbach, M., Kumar, V.
27 **Enhancing data analysis with noise removal**
(2006) *IEEE Transactions on Knowledge and Data Engineering*, 18 (3), pp. 304-319. [Cited 71 times](#).
doi: 10.1109/TKDE.2006.46
[View at Publisher](#)
- Xu, Y., Jin, X., Dai, Q.
28 **Spatial-temporal depth de-noising for kinect based on texture edge-assisted depth classification**
(2014) *International Conference on Digital Signal Processing, DSP*, 2014-January, art. no. 6900681, pp. 327-332. [Cited 2 times](#).
ISBN: 978-147994612-9
doi: 10.1109/ICDSP.2014.6900681
[View at Publisher](#)
- Yu, Y.
29 A Shadow Repair Approach For Kinect Depth Maps
(2013) *Computer Vision-Accv 2012*, pp. 615-626.
Springer

Karbasi, M.; Khulliyah of Information and Communication Technology, International Islamic University Malaysia, Malaysia;
email: Mostafa.karbasi@live.iium.edu.my

© Copyright 2016 Elsevier B.V., All rights reserved.

[Back to results](#) | 1 of 1

[Top of page](#)

About Scopus

[What is Scopus](#)
[Content coverage](#)
[Scopus blog](#)
[Scopus API](#)
[Privacy matters](#)

Language

[日本語に切り替える](#)
[切换到简体中文](#)
[切换到繁體中文](#)

Customer Service

[Help](#)
[Live Chat](#)
[Contact us](#)

ELSEVIER

[Terms and conditions](#) [Privacy policy](#)

Copyright © 2017 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

Cookies are set by this site. To decline them or learn more, visit our [Cookies page](#).

 RELX Group™