

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

[↗ Export](#) [↓ Download](#) [🖨 Print](#) [✉ E-mail](#) [📄 Save to PDF](#) [★ Add to List](#) [More... >](#)
[Full Text](#)

18th IEEE International Multi-Conference on Systems, Signals and Devices, SSD 2021 • Pages 445 - 450 • 22 March 2021 • Article number 9429305 • 18th IEEE International Multi-Conference on Systems, Signals and Devices, SSD 2021 • Monastir • 22 March 2021 through 25 March 2021 • Code 169112

**Document type**

Conference Paper

**Source type**

Conference Proceedings

**ISBN**

978-166541493-7

**DOI**

10.1109/SSD52085.2021.9429305

**Publisher**

Institute of Electrical and Electronics Engineers Inc.

**Sponsors**

Djelfa Info • Tunisian Association of Applied Sciences and Technologies (ATSAT)

**Original language**

English

View less ^

# Imperceptibility Analysis for Watermarking Technique Based on Image Block Division Scheme

 Abdullad M.J.<sup>a</sup> [✉](#), Ismail A.R.<sup>a</sup> [✉](#), Abubakar A.<sup>a</sup> [✉](#)
[📁 Save all to author list](#)
<sup>a</sup> International Islamic University Malaysia, Department of Computer Science, Kuala Lumpur, Malaysia

 Full text options [v](#)
**Abstract**

Author keywords

Indexed keywords

SciVal Topics

Metrics

**Abstract**

Image watermarking techniques proposed different algorithm schemes to improve performance quality. For a medical image, the watermarking techniques are required to give significant attention to achieve the highest imperceptibility performance to remain visual quality. That is why this paper analyzes two different watermarking algorithm schemes: image block division  $8^{\ast}8$  and image block division  $2^{\ast}2$  to determine the imperceptibility performance for each. Both schemes used the fitness evaluation to evaluate the imperceptibility performance of each embedding location. Thereafter, the imperceptibility, embedding capacity, and watermark data bit error of both schemes were measured. The experiment results show that the image block division  $8^{\ast}8$  scheme outperformed in imperceptibility performance under Peak Signal-To-Noise Ratio (PSNR) values for the three different watermarked medical images is 106.1014 to 110.5222. The image block division  $2^{\ast}2$  scheme outperformed in embedding capacity and watermark data bit error where the embedding capacity is 1449 to 31953 bit and watermark data bit error is zero for the three different watermarked medical images. This finding indicates that the watermarking technique with image block division  $2^{\ast}2$  scheme can achieve more accurate performance. © 2021 IEEE.

**Author keywords**

Block; DWT; image; imperceptibility; watermarking technique

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)
**Related documents**

Analysis of Watermarking Techniques with Wavelet and Cosine Transform for Imperceptibility on Image

Abdullad, M.J. , Ismail, A.R. , Abubakar, A. (2021) 18th IEEE International Multi-Conference on Systems, Signals and Devices, SSD 2021

A blind medical image watermarking: DWT-SVD based robust and secure approach for telemedicine applications

Thakkar, F.N. , Srivastava, V.K. (2017) Multimedia Tools and Applications

A watermarking scheme for source authentication, ownership identification, tamper detection and restoration for color medical images






Laishram, D. , Manglem Singh, K. (2021) Multimedia Tools and Applications

View all related documents based on references

Find more related documents in Scopus based on:

Authors &gt; Keywords &gt;

## References (19)

[View in search results format >](#) All  [Export](#)  [Print](#)  [E-mail](#)  [Save to PDF](#)  [Create bibliography](#)

- 
- 1 Venkateswarlu, L., Rao, N.V., Reddy, B.E.  
(2018) *A Robust Dual Watermarking Technique for Medical Images in EHealthcare Records?*, *Helix*, 8, p. 2.
- 
- 2 Balasamy, K.  
An intelligent reversible watermarking system for authenticating medical images using Wavelet and PSO?  
(2018) *Cluster Comput*, 8. Cited 7 times.
- 
- 3 Tsai, M.-J., Hung, H.-Y.  
DCT and DWT-based image watermarking by using subsampling  
(2004) *Proceedings - International Conference on Distributed Computing Systems*, 24, pp. 184-189. Cited 29 times.
- 
- 4 Singh, A.K.  
Improved hybrid algorithm for robust and imperceptible multiple watermarking using digital images  
(2017) *Multimedia Tools and Applications*, 76 (6), pp. 8881-8900. Cited 91 times.  
doi: 10.1007/s11042-016-3514-z  
[View at Publisher](#)
- 
- 5 Swaraja K  
Medical image region based watermarking for secured telemedicine  
(2018) *Multimedia Tools and Applications*, 77 (21), pp. 28249-28280. Cited 22 times.  
<https://link.springer.com/journal/11042>  
doi: 10.1007/s11042-018-6020-7  
[View at Publisher](#)
- 
- 6 Kumar, S., Jha, R.K.  
FD-based detector for medical image watermarking  
(2019) *IET Image Processing*, 13 (10), pp. 1773-1782. Cited 7 times.  
[www.ietdl.org/IET-IPR](http://www.ietdl.org/IET-IPR)  
doi: 10.1049/iet-ipr.2018.5485  
[View at Publisher](#)
- 
- 7 Laouamer, L., Alshaikh, M., Nana, L., Pascu, A.  
A novel ct scan images watermarking scheme in dwt transform coefficients  
(2016) *IJCSNS Int. J. Comput. Sci. Netw. Secur*, 16. Cited 10 times.  
Jan
- 
- 8 Ayad, H., Khalil, M.  
Qam-dwt-svd based watermarking scheme for medical images  
(2018) *Int. J. Interact. Multimed. Artif. Intell*, 5. Cited 6 times.
-

- 9 Venugopal Reddy, C., Siddaiah, P.  
(2015) *Hybrid LWT-SVD Watermarking Optimized Using Metaheuristic Algorithms along with Encryption for Medical Image security?*6, (1), pp. 75-95. Cited 2 times.
- 
- 10 Mohananthini, N., Yamuna, G.  
Comparison of multiple watermarking techniques using genetic algorithms  
(2016) *J. Electr. Syst. Inf. Technol*, 3 (1), pp. 68-80. Cited 38 times.
- 
- 11 Singh, A., Dutta, M.K.  
Wavelet-based reversible watermarking system for integrity control and authentication in tele-ophthalmological applications  
  
(2016) *International Journal of Electronic Security and Digital Forensics*, 8 (4), pp. 392-411. Cited 14 times.  
<http://www.inderscience.com/ijesdf>  
doi: 10.1504/IJESDF.2016.079452  
  
View at Publisher
- 
- 12 Thakkar, F.N., Srivastava, V.K.  
A blind medical image watermarking: DWT-SVD based robust and secure approach for telemedicine applications  
  
(2017) *Multimedia Tools and Applications*, 76 (3), pp. 3669-3697. Cited 104 times.  
doi: 10.1007/s11042-016-3928-7  
  
View at Publisher
- 
- 13 Siddaraju, P.M., Jayadevappa, D., Ezhilarasan, K.  
Application of fractional wave packet transform for robust watermarking of mammograms (Open Access)  
  
(2015) *International Journal of Telemedicine and Applications*, 2015, art. no. 123790. Cited 5 times.  
<http://www.hindawi.com/journals/ijta/biblio/>  
doi: 10.1155/2015/123790  
  
View at Publisher
- 
- 14 Priya, S., Santhi, P., Swaminathan, P., Raja Mohan, J.  
Hybrid transform based reversible watermarking technique for medical images in telemedicine applications  
(2017) *Opt. -Int. J. Light Electron*. Cited 5 times.
- 
- 15 Singh, A.K., Dave, M., Mohan, A.  
Robust and secure multiple watermarking in wavelet domain  
  
(2015) *Journal of Medical Imaging and Health Informatics*, 5 (2), pp. 406-414. Cited 49 times.  
<http://docserver.ingentaconnect.com/deliver/connect/asp/21567018/v5n2/s34.pdf?expires=1422068109&id=80565956&titleid=41000046&accname=Elsevier+BV&checksum=57EB235C18C397CD428F354C86521A6E>  
doi: 10.1166/jmihi.2015.1407  
  
View at Publisher
- 
- 16 Taha, D.B., Taha, T.B., Dabagh, N.B.A.  
A comparison between the performance of DWT and LWT in image watermarking (Open Access)  
  
(2020) *Bulletin of Electrical Engineering and Informatics*, 9 (3), pp. 1005-1014. Cited 5 times.  
<http://beei.org/index.php/EEI/article/download/1754/1426>  
doi: 10.11591/eei.v9i3.1754  
  
View at Publisher
- 
- 17 Bhinder, P., Jindal, N., Singh, K.  
(2019) *An Improved Robust Image-adaptive Watermarking with Two Watermarks Using Statistical Decoder?*

□ 18 Zhong, X., Shih, F.Y.  
A High-Capacity Reversible Watermarking Scheme Based on Shape Decomposition for Medical Images  
(2019) *International Journal of Pattern Recognition and Artificial Intelligence*, 33 (1), art. no. 1950001. Cited 6 times.  
<http://www.worldscinet.com/ijprai/>  
doi: 10.1142/S0218001419500010  
[View at Publisher](#)

□ 19 Parah, S.A., Sheikh, J.A., Ahad, F., Loan, N.A., Bhat, G.M.  
Information hiding in medical images: a robust medical image watermarking system for E-healthcare  
(2017) *Multimedia Tools and Applications*, 76 (8), pp. 10599-10633. Cited 106 times.  
doi: 10.1007/s11042-015-3127-y  
[View at Publisher](#)

© Copyright 2021 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](#)  
[Русский язык](#)

## Customer Service

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

ELSEVIER

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

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

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies.

 RELX