

Document details

< Back to results | 1 of 3 Next >

Export Download Print E-mail Save to PDF Add to List More... >

Full Text View at Publisher

Proceedings of the 2018 7th International Conference on Computer and Communication Engineering, ICCCE 2018
16 November 2018, Article number 8539281, Pages 459-464
7th International Conference on Computer and Communication Engineering, ICCCE 2018; Kuala Lumpur; Malaysia; 19 September 2018 through 20 September 2018; Category numberCFP1839D-USB; Code 142740

Blood Vein Detection System for SmartPhones (Conference Paper)

Ahmed, K.I. ✉, Habaebi, M.H. ✉, Islam, M.R. ✉

Department of Electrical and Computer Engineering, International Islamic University Malaysia, Malaysia

Abstract

View references (22)

Needle infusion into the body for the nurses or medical respondents is one of the most common activities in current clinical activities. However, a considerable number of mistakes are occurring by the medical practitioner because of the vein pattern that is beneath the human skin and sometimes unidentifiable. These inaccuracies can lead to unavoidable bad circumstances for both patients and phlebotomists. Here, a mechanism that can alleviate that is necessary. The major objective of this research is to develop a real-time process for the detection of the vein by the phlebotomists along with an application in the most widely used handheld device (Android Smartphones) to avoid or at least diminish the number of inevitable scenarios for the patients and the nurses in their SOPs. Illuminated infrared light in the blood cells of the vein is absorbed due to the manifestation of the Haemoglobin in blood and the IR non-blocking camera can capture the vein patterns in the IR light spectrum. Contrast Limited Adaptive Histogram Equalization (CLAHE) algorithm was used to enhance the pattern of the vein in the Android application developed using OpenCV3. Developed system can detect the veins up to 7mm underneath of human skin in real time with a frame rate of 25fps. This is a far better improvement than commercial systems that can detect veins only below 10mm underneath the skin. Moreover, this system not only focused on needle infusion but also it can be used to indicate the place of bleeding for the clots from the human body strokes, etc. in the upper layer of skin. It can also be used to detect measure liquids in encapsulated in confined dark bottles, for example, liquid chemical pouring into the bottles in the chemical companies, liquid medicine pouring to bottles, etc. © 2018 IEEE.

SciVal Topic Prominence ⓘ

Topic: Biometrics | Feature extraction | finger-vein recognition

Prominence percentile: 88.107 ⓘ

Author keywords

Biometrics CLAHE Energy Security Near Infrared Real Time Vein Vein Detection

Indexed keywords

Engineering controlled terms: Biometrics Blood Energy security Infrared devices Liquids Medical computing mHealth Needles Nursing Smartphones

Engineering uncontrolled terms: Android applications Chemical companies CLAHE Commercial systems Contrast Limited Adaptive Histogram Equalization (CLAHE) Medical practitioner

Metrics ⓘ

0 Citations in Scopus
0 Field-Weighted Citation Impact



PlumX Metrics Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

A real time vein detection system
Ahmed, K.I. , Habaebi, M.H. , Islam, M.R.
(2018) Indonesian Journal of Electrical Engineering and Computer Science

Enhanced vision based vein detection system
Ahmed, K.I. , Habaebi, M.H. , Islam, M.R.
(2018) 2017 IEEE International Conference on Smart Instrumentation, Measurement and Applications, ICSIMA 2017

Enhanced vein detection from video sequences
Ahmed, K.I. , Habaebi, M.H. , Islam, M.R.
(2017) Indonesian Journal of Electrical Engineering and Computer Science

ISBN: 978-153866991-4
Source Type: Conference Proceeding
Original language: English

DOI: 10.1109/ICCCE.2018.8539281
Document Type: Conference Paper
Publisher: Institute of Electrical and Electronics Engineers Inc.

References (22)

[View in search results format >](#)

All [Export](#) [Print](#) [E-mail](#) [Save to PDF](#) [Create bibliography](#)

- 1 Al Ghozali, H.K., Setiawardhana, Sigit, R.

Vein detection system using infrared camera

(2016) Proceedings - 2016 International Electronics Symposium, IES 2016, art. no. 7860987, pp. 122-127. Cited 6 times.

ISBN: 978-150901640-2

doi: 10.1109/ELECSYM.2016.7860987

[View at Publisher](#)

- 2 (2016) Satellite Imagery. Cited 2 times.

D. DV [Accessed: 12-Dec-2017]

<https://fomm.nasaspaceflight.com/index.php?topic=39617.0>

- 3 Olson, K.

Circulatory system

(2000) The Laboratory Fish. Cited 11 times.

[Accessed: 05-Nov-2017]

<https://socratic.org/questions/what-layer-of-skin-contains-The-blood-vessels-and-nerves>

- 4 Nielsen, K.P., Zhao, L., Ryzhikov, G.A., Biryulina, M.S., Sommersten, E.R., Stamnes, J.J., Stamnes, K., (...), Moan, J.

Retrieval of the physiological state of human skin from UV-Vis reflectance spectra - A feasibility study

(2008) Journal of Photochemistry and Photobiology B: Biology, 93 (1), pp. 23-31. Cited 25 times.

doi: 10.1016/j.jphotobiol.2008.06.010

[View at Publisher](#)

- 5 Ficke, B.W., Ransom, E.F., Oakes, J.E.

Near-Infrared Vein Visualization in Index Finger Pollicization

(2017) Journal of Hand Surgery, 42 (6), pp. 481.e1-481.e2. Cited 7 times.

<http://www.elsevier.com/inca/publications/store/6/2/3/1/4/5/index.htm>

doi: 10.1016/j.jhssa.2017.03.039

[View at Publisher](#)

- 6 Dai, X., Zhou, Y., Hu, X., Liu, M., Zhu, X., Wu, Z.

A fast vein display device based on the camera-projector system

(2013) IST 2013 - 2013 IEEE International Conference on Imaging Systems and Techniques, Proceedings, art. no. 6729680, pp. 146-149. Cited 7 times.

[View at Publisher](#)

- 7 Meng, G.C., Shahzad, A., Saad, N.M., Malik, A.S., Meriaudeau, F.
Prototype design for wearable veins localization system using near infrared imaging technique

(2015) Proceedings - 2015 IEEE 11th International Colloquium on Signal Processing and Its Applications, CSPA 2015, art. no. 7225628, pp. 112-115. Cited 7 times.
ISBN: 978-147998249-3
doi: 10.1109/CSPA.2015.7225628

[View at Publisher](#)

- 8 Besra, B., Mohapatra, R.K.
Extraction of segmented vein patterns using repeated line tracking algorithm

(2017) Proceedings of 2017 3rd IEEE International Conference on Sensing, Signal Processing and Security, ICSSS 2017, art. no. 8071571, pp. 89-92. Cited 6 times.
ISBN: 978-150904929-5
doi: 10.1109/SSPS.2017.8071571

[View at Publisher](#)

- 9 Gnee, N.S.
A study of hand vein, neck vein and arm vein extraction for authentication

(2009) ICICS 2009 - Conference Proceedings of the 7th International Conference on Information, Communications and Signal Processing, art. no. 5397752. Cited 6 times.
ISBN: 978-142444657-5
doi: 10.1109/ICICS.2009.5397752

[View at Publisher](#)

- 10 Yusoff, S., Ramli, A.R., Hashim, S.J., Rokhani, F.Z.
Review on vein enhancement methods for biometric system
(2015) Int. J. Res. Eng. Technol, 4 (4), pp. 833-841. Cited 7 times.

- 11 (2016) Infrared Vein Finder | VeinViewer Flex | Christie Medical
Christie Medical Holdings [Accessed: 26-Sep-2017]
<https://www.christiemed.com/products/veinviewer-models/veinviewer-flex>
-

- 12 Marathe, M., Bhatt, N.S., Sundararajan, R.
A novel wireless vein finder
- (2014) Proceedings of International Conference on Circuits, Communication, Control and Computing, I4C 2014, art. no. 7057805, pp. 277-280. Cited 5 times.
ISBN: 978-147996546-5
doi: 10.1109/CIMCA.2014.7057805

[View at Publisher](#)

- 13 Fletcher, R.R., Raghavan, V., Zha, R., Haverkamp, M., Hibberd, P.L.
Development of mobile-based hand vein biometrics for global health patient identification

(2014) Proceedings of the 4th IEEE Global Humanitarian Technology Conference, GHTC 2014, art. no. 6970336, pp. 541-547. Cited 5 times.
ISBN: 978-147997193-0

[View at Publisher](#)

- 14 Wadhvani, M., Sharma, A.D., Pillai, A., Pisal, N., Bhowmick, M.
Vein detection system using infrared light
(2015) Int. J. Sci. Eng. Res, 6 (12), pp. 780-786. Cited 5 times.
-

- 15 Kanzawa, Y., Kimura, Y., Naito, T.
Human skin detection by visible and near-infrared imaging

(2011) Proceedings of the 12th IAPR Conference on Machine Vision Applications, MVA 2011, pp. 503-507. Cited 20 times.
ISBN: 978-490112211-5
-

- 16 Kacmaz, S., Ercelebi, E., Zengin, S., Cindoruk, S.
The use of infrared thermal imaging in the diagnosis of deep vein thrombosis

(2017) Infrared Physics and Technology, 86, pp. 120-129. Cited 7 times.
doi: 10.1016/j.infrared.2017.09.005

[View at Publisher](#)
-

- 17 Ma, J., Fan, X., Yang, S.X., Zhang, X., Zhu, X.
Contrast limited adaptive histogram equalization based fusion for underwater image enhancement
(2017) Preprints, p. 127.
March
-

- 18 Aarthy, M., Sumathy, P.
A comparison of histogram equalization method and histogram expansion
(2014) Int. J. Comput. Sci. Mob. Appl, 2 (3), pp. 25-34. Cited 5 times.
-

- 19 Khan, R.
Comparison and analysis of various histogram equalization techniques
(2012) Int. J. Eng. Sci. Technol, 4 (4), pp. 1787-1792. Cited 3 times.
-

- 20 Ahmed, K.I., Habaebi, M.H., Islam, M.R.
Enhanced vein detection from video sequences

(2017) Indonesian Journal of Electrical Engineering and Computer Science, 8 (2), pp. 420-427. Cited 4 times.
<http://www.iaescore.com/journals/index.php/IJEECS/article/download/10011/7645>
doi: 10.11591/ijeecs.v8.i2.pp420-427

[View at Publisher](#)
-

- 21 Ahmed, K.I., Habaebi, M.H., Islam, M.R., Zainal, N.A.B.
Enhanced vision based vein detection system

(2018) 2017 IEEE International Conference on Smart Instrumentation, Measurement and Applications, ICSIMA 2017, 2017-November, pp. 1-6. Cited 2 times.
ISBN: 978-153863960-3
doi: 10.1109/ICSIMA.2017.8311990

[View at Publisher](#)

□ 22 Ahmed, K.I., Habaebi, M.H., Islam, M.R.

A real time vein detection system

(2018) Indonesian Journal of Electrical Engineering and Computer Science, 10 (1), pp. 129-137.

<http://www.iaescor.com/journals/index.php/IJECS/article/download/10868/8193>

doi: 10.11591/ijeecs.v10.i1.pp127-137

[View at Publisher](#)

🔍 Habaebi, M.H.; Department of Electrical and Computer Engineering, International Islamic University Malaysia, Malaysia; email:habaebi@iiium.edu.my

© Copyright 2019 Elsevier B.V., All rights reserved.

< Back to results | 1 of 3 Next >

^ 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 © 2019 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 Group™