Document details

‹ Back to results | ‹ Previous 41 of 50 Next ›

CSV export Download Print E-mail Save to PDF Save to list More... ›

Full Text View at Publisher

Advances in Intelligent Systems and Computing
Volume 1350 AISC, 2021, Pages 1-10
2nd International Conference on Innovative Technology, Engineering and Sciences, iCITES 2020;
Pekan; Malaysia; 22 December 2020 through 22 December 2020; Code 256319

Multilanguage Speech-Based Gender Classification Using Time-Frequency Features and SVM Classifier (Conference Paper)

Wani, T.M.[a], Gunawan, T.S.[a,b] ✉, Mansor, H.[a], Qadri, S.A.A.[a], Sophian, A.[c], Ambikairajah, E.[b], Ihsanto, E.[d]

Save all to author list

[a] Electrical and Computer Engineering Department, International Islamic University Malaysia, Gombak, Malaysia
[b] School of Electrical Engineering and Telecommunications, UNSW, Sydney, Australia
[c] Mechatronics Engineering Department, International Islamic University Malaysia, Gombak, Malaysia

View additional affiliations

Abstract

View references (24)

Speech is the most significant communication mode among human beings and a potential method for human-computer interaction (HCI). Being unparallel in complexity, the perception of human speech is very hard. The most crucial characteristic of speech is gender, and for the classification of gender often pitch is utilized. However, it is not a reliable method for gender classification as in numerous cases, the pitch of female and male is nearly similar. In this paper, we propose a time-frequency method for the classification of gender-based on the speech signal. Various techniques like framing, Fast Fourier Transform (FFT), auto-correlation, filtering, power calculations, speech frequency analysis, and feature extraction and formation are applied on speech samples. The classification is done based on features derived from the frequency and time domain processing using the Support Vector Machines (SVM) algorithm. SVM is trained on two speech databases Berlin Emo-DB and IITKGP-SEHSC, in which a total of 400 speech samples are evaluated. An accuracy of 83% and 81% for IITKGP-SEHSC and Berlin Emo-DB have been observed, respectively.

SciVal Topic Prominence

Topic: Speaker Recognition | Speech Signal | Public Speaking

Prominence percentile: 46.229

Author keywords

Fast-Fourier Transform (FFT) | Gender classification | Pre-processing | Support Vector Machine (SVM)

Indexed keywords

Engineering controlled terms: Classification (of information) | Continuous speech recognition | Fast Fourier transforms | Human computer interaction | Speech | Speech communication | Time domain analysis

Engineering uncontrolled terms: Communication mode | Frequency Analysis | Frequency and time domains | Gender classification | Human computer interaction (HCI) | Support vector machines algorithms | Time frequency features | Time-frequency methods

Engineering main heading: Support vector machines

Funding details

Funding sponsor	Funding number	Acronym
Ministry of Education - Singapore	076-0684,FRGS/1/2018/ICT02/UIAM/02/4	MOE
University of New South Wales See opportunities by UNSW↗		UNSW
Ministry of Higher Education, Malaysia		MOHE
Universitas Mercu Buana		UMB

Funding text

The authors would like to express their gratitude to the Malaysian Ministry of Education (MOE), which has provided research funding through the Fundamental Research Grant, FRGS19?076-0684 (FRGS/1/2018/ICT02/UIAM/02/4). The authors would like to acknowledge support from International Islamic University, University of New South Wales, and Universitas Mercu Buana.

ISSN: 21945357
ISBN: 978-303070916-7
Source Type: Book Series
Original language: English

DOI: 10.1007/978-3-030-70917-4_1
Document Type: Conference Paper
Volume Editors: Mat Jizat J.A.,Khairuddin I.M.,Mohd Razman M.A.,Ab. Nasir A.F.,Abdul Karim M.S.,Jaafar A.A.,Hong L.W.,Abdul Majeed A.P.,Liu P.,Myung H.,Choi H.,Susto G.
Publisher: Springer Science and Business Media Deutschland GmbH

References (24)

View in search results format >

All | CSV export | Print | E-mail | Save to PDF | Create bibliography

1 Dabrowski, A., Marciniak, T.
Audio signal processing

(2001) *The Computer Engineering Handbook*, pp. 27-1-27-37.
https://www.taylorfrancis.com/books/9781420041545
ISBN: 978-142004154-5; 978-084930885-7

2 Breslin, S., Wadhwa, B.
Gender and Human-Computer Interaction

(2017) *The Wiley Handbook of Human Computer Interaction Set*, 1, pp. 71-87. Cited 5 times.
http://onlinelibrary.wiley.com/book/10.1002/9781118976005
ISBN: 978-111897600-5; 978-111897613-5
doi: 10.1002/9781118976005.ch4

View at Publisher

3 Sedaaghi, M.H.
A comparative study of gender and age classification in speech signals
(2009) *Iran. J. Electr. Electron. Eng.*, 5 (1), pp. 1-12. Cited 31 times.

4 Doukhan, D., Carrive, J., Vallet, F., Larcher, A., Meignier, S.

An Open-Source Speaker Gender Detection Framework for Monitoring Gender Equality (Open Access)

(2018) *ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings*, 2018-April, art. no. 8461471, pp. 5214-5218. Cited 17 times.
ISBN: 978-153864658-8
doi: 10.1109/ICASSP.2018.8461471

View at Publisher

5 Zhang, W., Smith, M.L., Smith, L.N., Farooq, A.: Gender and gaze gesture recognition for human-computer interaction. Comput. Vis. Image Underst. 149, 32–50 (2016). https://doi. org/10.1016/j.cviu.2016.03.014

6 Harb, H., Chen, L.

Voice-based gender identification in multimedia applications

(2005) *Journal of Intelligent Information Systems*, 24 (2-3), pp. 179-198. Cited 55 times.
doi: 10.1007/s10844-005-0322-8

View at Publisher

7 Alkhawaldeh, R.S.

DGR: Gender Recognition of Human Speech Using One-Dimensional Conventional Neural Network (Open Access)

(2019) *Scientific Programming*, 2019, art. no. 7213717. Cited 11 times.
http://www.iospress.nl
doi: 10.1155/2019/7213717

View at Publisher

8 Simpson, A.P.

Phonetic differences between male and female speech

(2009) *Linguistics and Language Compass*, 3 (2), pp. 621-640. Cited 118 times.
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1749-818X
doi: 10.1111/j.1749-818X.2009.00125.x

View at Publisher

9 Vorperian, H.K., Kent, R.D., Lee, Y., Bolt, D.M.

Corner vowels in males and females ages 4 to 20 years: Fundamental and F1-F4 formant frequencies (Open Access)

(2019) *Journal of the Acoustical Society of America*, 146 (5), pp. 3255-3274. Cited 4 times.
http://scitation.aip.org/content/asa/journal/jasa
doi: 10.1121/1.5131271

View at Publisher

10 Archana, G.S., Malleswari, M.

Gender identification and performance analysis of speech signals

(2015) *Global Conference on Communication Technologies, GCCT 2015*, art. no. 7342709, pp. 483-489. Cited 10 times.
ISBN: 978-147998553-1
doi: 10.1109/GCCT.2015.7342709

View at Publisher

11 Zeng, Y.-M., Wu, Z.-Y., Falk, T., Chan, W.-Y.
Robust GMM based gender classification using pitch and RASTA-PLP parameters of speech

(2006) *Proceedings of the 2006 International Conference on Machine Learning and Cybernetics*, 2006, art. no. 4028651, pp. 3376-3379. Cited 54 times.
ISBN: 1424400619; 978-142440061-4
doi: 10.1109/ICMLC.2006.258497

View at Publisher

12 Yücesoy, E., Nabiyev, V.V.
Comparison of MFCC, LPCC and PLP features for the determination of a speaker's gender

(2014) *2014 22nd Signal Processing and Communications Applications Conference, SIU 2014 - Proceedings*, art. no. 6830230, pp. 321-324. Cited 8 times.
ISBN: 978-147994874-1
doi: 10.1109/SIU.2014.6830230

View at Publisher

13 Yusnita, M.A., Hafiz, A.M., Fadzilah, M.N., Zulhanip, A.Z., Idris, M.
Automatic gender recognition using linear prediction coefficients and artificial neural network on speech signal

(2018) *Proceedings - 7th IEEE International Conference on Control System, Computing and Engineering, ICCSCE 2017*, 2017-November, pp. 372-377. Cited 8 times.
ISBN: 978-153863897-2
doi: 10.1109/ICCSCE.2017.8284437

View at Publisher

14 Buyukyilmaz, M., Cibikdiken, A.O.
(2016) *Voice Gender Recognition Using Deep Learning*. Cited 13 times.
https://doi.org/10.2991/msota-16.2016.90

15 Raahul, A., Sapthagiri, R., Pankaj, K., Vijayarajan, V.
Voice based gender classification using machine learning (Open Access)

(2017) *IOP Conference Series: Materials Science and Engineering*, 263 (4), art. no. 042083. Cited 7 times.
http://www.iop.org/EJ/journal/mse
doi: 10.1088/1757-899X/263/4/042083

View at Publisher

16 Pondhu, L.N., Kummari, G.
Performance Analysis of Machine Learning Algorithms for Gender Classification

(2018) *Proceedings of the International Conference on Inventive Communication and Computational Technologies, ICICCT 2018*, art. no. 8473192, pp. 1626-1628. Cited 3 times.
http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=8466130
ISBN: 978-153861974-2
doi: 10.1109/ICICCT.2018.8473192

View at Publisher

17 Burkhardt, F., Paeschke, A., Rolfes, M., Sendlmeier, W., Weiss, B.
(2005) *A Database of German Emotional Speech*. Cited 229 times.

18 Koolagudi, S.G., Reddy, R., Yadav, J., Rao, K.S.
IITKGP-SEHSC : Hindi speech corpus for emotion analysis

(2011) *2011 International Conference on Devices and Communications, ICDeCom 2011 - Proceedings*, art. no. 5738540. Cited 25 times.
ISBN: 978-142449190-2
doi: 10.1109/ICDECOM.2011.5738540

View at Publisher

19 Lin, F., Wu, Y., Zhuang, Y., Long, X., Xu, W.
Human gender classification: A review (Open Access)

(2016) *International Journal of Biometrics*, 8 (3-4), pp. 275-300. Cited 12 times.
http://www.inderscience.com/ijbm
doi: 10.1504/IJBM.2016.082604

View at Publisher

20 Barkana, B.D., Zhou, J.
A new pitch-range based feature set for a speaker's age and gender classification

(2015) *Applied Acoustics*, 98, pp. 52-61. Cited 32 times.
http://www.journals.elsevier.com/applied-acoustics/
doi: 10.1016/j.apacoust.2015.04.013

View at Publisher

21 Gupta, M., Bharti, S.S., Agarwal, S.
Support vector machine based gender identification using voiced speech frames

(2016) *2016 4th International Conference on Parallel, Distributed and Grid Computing, PDGC 2016*, art. no. 7913219, pp. 737-741. Cited 8 times.
ISBN: 978-150903668-4
doi: 10.1109/PDGC.2016.7913219

View at Publisher

22 Chaudhary, S., Sharma, D.K.
Gender Identification based on Voice Signal Characteristics

(2018) *Proceedings - IEEE 2018 International Conference on Advances in Computing, Communication Control and Networking, ICACCCN 2018*, art. no. 8748676, pp. 869-874. Cited 3 times.
http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=8742891
ISBN: 978-153864119-4
doi: 10.1109/ICACCCN.2018.8748676

View at Publisher

23 Qadri, S.A.A., Gunawan, T.S., Wani, T., Alghifari, M.F., Mansor, H., Kartiwi, M.
Comparative Analysis of Gender Identification using Speech Analysis and Higher Order Statistics

(2019) *2019 IEEE 6th International Conference on Smart Instrumentation, Measurement and Application, ICSIMA 2019*, art. no. 9057296.
http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=9049928
ISBN: 978-172813952-4
doi: 10.1109/ICSIMA47653.2019.9057296

View at Publisher

24 Shareef, M.S., Abd, T., Mezaal, Y.S.: Gender voice classification with huge accuracy rate. Telkomnika (Telecommun. Comput. Electron. Control) 18, 2612–2617 (2020). https://doi.org/10.12928/TELKOMNIKA.v18i5.13717

Gunawan, T.S.; Electrical and Computer Engineering Department, International Islamic University Malaysia, Gombak, Malaysia; email:tsgunawan@iium.edu.my

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
切換到繁體中文
Русский язык

Customer Service

Help
Contact us