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Pořadové číslo: 1/17

ID publikace:	43878829
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Interpretable Local Frequency Binary Pattern (LFrBP) based Joint Continual Learning Network for Heterogeneous Face Recognition
Rok publikace:	2022
Autor:	H. Roy (Prac.:)
Autor:	Debotosh Bhattacharjee (Prac.: DěkFIM)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	IEEE Transactions on Information Forensics and Security
Číslo/kód:	June
ISSN:	1556-6013
Ročník:	17
Strany:	2125-2136
Abstrakt orig.:	Heterogeneous Face Recognition (HFR) is a challenging task due to the significant intra-class variation between the query and gallery images. The reason behind this vast intra-class variation is the varying image capturing sensors and the varying image representation techniques. Visual, Infrared, thermal images are the output of different sensors and viewed sketches, and composite sketches are the output of different image representation techniques. Conventional deep learning models are trying to solve the problem. Still, progress is impeded due to small HFR data samples, task-specific models (one model trained for face sketch-photo matching can't perform well for NIR-VIS face matching), joint learning of two different HFR scenarios are not possible by one single deep network, and models are not interpretable. In this paper, to solve these major problems, we presented a novel interpretable Local Frequency Binary Pattern (LFrBP) based continual learning shallow network for HFR. The model is divided into two parts. A modality-invariant CNN model using the LFrBP feature, fine-tuned with CNN, is presented in the first part. The second part is based on continual learning to jointly learn the two HFR scenarios (face sketch-photo and NIR-VIS face matching) using a single network. Recognition results on different challenging HFR databases depict the superiority of the proposed model over other state-of-the-art deep learning-based methods. IEEE
Počet stran:	12
Odkazy:	https://ieeexplore.ieee.org/document/9786806
Hlavní klíč:	continual learning;Convolutional neural networks;deep learning;Face recognition;Feature extraction;heterogeneous face recognition;Image edge detection;interpretable network;joint learning;Local Frequency Binary Pattern;modality-invariant;Task analysis
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Interpretable Local Frequency Binary Pattern (LFrBP) based Joint Continual Learning Network for Heterogeneous Face Recognition
Datum vložení:	20.06.2022
Financování:	S -

Pořadové číslo: 2/17

Pořadové číslo: 3/17

ID publikace:	43878866
Stav:	Přijatý
Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	Sperm-cell Detection Using YOLOv5 Architecture
Rok publikace:	2022
Autor:	Michal Dobrovolný (Prac.: CZAV)
Autor:	Jakub Beneš (Prac.: DěkFIM)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Autor:	Ali Bin Selamat (Prac.: CZAV)
Název zdroje:	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)
Místo publikace:	Švýcarsko
ISSN:	0302-9743
ISBN:	978-3-031-07801-9
Ročník:	13347 LNBI
Strany:	319-330
Abstrakt orig.:	Infertility has become a severe health issue in recent years. Sperm morphology, sperm motility, and sperm density are the most critical factors in male infertility. As a result, sperm motility, density, and morphology are examined in semen analysis carried out by laboratory professionals. However, applying a subjective analysis based on laboratory observation is easy to make a mistake. To reduce the effect of specialists in semen analysis, a computer-aided sperm count estimation approach is proposed in this work. The quantity of active sperm in the semen is determined using object detection methods focusing on sperm motility. The proposed strategy was tested using data from the Visem dataset provided by Association for Computing Machinery. We created a small sample custom dataset to prove that our network will be able to detect sperms in images. The best not-super tuned result is mAP 72.15. © 2022, Springer Nature Switzerland AG.
Počet stran:	12
Odkazy:	https://link.springer.com/chapter/10.1007/978-3-031-07802-6_27
Hlavní klíč:	Computer-aided sperm analysis; Small-object detection; Sperm-cell detection; Yolo
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Sperm-cell Detection Using YOLOv5 Architecture
Datum konání:	27.06.2022
Datum vložení:	10.07.2022
Financování:	S -

Pořadové číslo: 4/17

ID publikace:	43878908
Stav:	Přijatý
Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	Classification of Breast Tumor from Ultrasound Images Using No-Reference Image Quality Assessment
Rok publikace:	2023
Autor:	Ratnadeep Dey (Prac.:)
Autor:	Debotosh Bhattacharjee (Prac.: DěkFIM)
Autor:	Christian Kollmann (Prac.:)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	Lecture Notes in Networks and Systems
Místo publikace:	Singapore
ISSN:	2367-3370
ISBN:	978-981-19010-4-1
Strany:	341-349
Abstrakt orig.:	A computer-aided diagnosis (CAD) system can be helpful for the detection of malignant tumors in the breast. Ultrasound imaging is a type modality with low cost and lower health risk. In this paper, we have classified benign and malignant breast tumors from ultrasound images. We have used the image quality assessment approach for this purpose. No-reference image quality metrics have been used as features for the classification task. We have used a public database of ultrasound images of breast tumors containing 780 images. The classification of breast ultrasound images using image quality assessment is a very novel approach, producing significant results.
Počet stran:	9
Odkazy:	https://link.springer.com/chapter/10.1007/978-981-19-0105-8_33
Hlavní klíč:	Breast cancer detection; Breast ultrasound image; Image quality assessment; No-reference image quality metric
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Classification of Breast Tumor from Ultrasound Images Using No-Reference Image Quality Assessment
Datum konání:	30.09.2021
Datum vložení:	01.08.2022
Financování:	S -

Pořadové číslo: 5/17

ID publikace:	43878927
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	A novel multi-scale based deep convolutional neural network for detecting COVID-19 from X-rays
Rok publikace:	2022
Autor:	Mohan Karnati (Prac.:)
Autor:	Ayan Seal (Prac.:)
Autor:	Geet Sahu (Prac.:)
Autor:	Anis Yazidi (Prac.:)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	Applied soft computing
Místo publikace:	Amsterdam
Číslo/kód:	August
ISSN:	1568-4946
Vydavatel:	Elsevier
Ročník:	125
Strany:	"Article Number: 109109"
Abstrakt orig.:	The COVID-19 pandemic has posed an unprecedented threat to the global public health system, primarily infecting the airway epithelial cells in the respiratory tract. Chest X-ray (CXR) is widely available, faster, and less expensive therefore it is preferred to monitor the lungs for COVID-19 diagnosis over other techniques such as molecular test, antigen test, antibody test, and chest computed tomography (CT). As the pandemic continues to reveal the limitations of our current ecosystems, researchers are coming together to share their knowledge and experience in order to develop new systems to tackle it. In this work, an end-to-end IoT infrastructure is designed and built to diagnose patients remotely in the case of a pandemic, limiting COVID-19 dissemination while also improving measurement science. The proposed framework comprises six steps. In the last step, a model is designed to interpret CXR images and intelligently measure the severity of COVID-19 lung infections using a novel deep neural network (DNN). The proposed DNN employs multi-scale sampling filters to extract reliable and noise-invariant features from a variety of image patches. Experiments are conducted on five publicly available databases, including COVIDx, COVID-19 Radiography, COVIDXRay-5K, COVID-19-CXR, and COVIDchestxray, with classification accuracies of 96.01%, 99.62%, 99.22%, 98.83%, and 100%, and testing times of 0.541, 0.692, 1.28, 0.461, and 0.202 s, respectively. The obtained results show that the proposed model surpasses fourteen baseline techniques. As a result, the newly developed model could be utilized to evaluate treatment efficacy, particularly in remote locations. (C) 2022 Elsevier B.V. All rights reserved.
Počet stran:	17
Odkazy:	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9167691/
Hlavní klíč:	COVID-19; Chest X-ray; Deep neural network; Internet of things
Jazyk (originál):	angličtina (eng)
Titul anglicky:	A novel multi-scale based deep convolutional neural network for detecting COVID-19 from X-rays
Datum vložení:	18.08.2022
Financování:	S -

Pořadové číslo: 6/17

ID publikace:	43879179
Stav:	Přijatý
Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	Cycle Route Signs Detection Using Deep Learning
Rok publikace:	2022
Autor:	Lukáš Kopecký (Prac.: DěkFIM)
Autor:	Michal Dobrovolný (Prac.: CZAV)
Autor:	A. Fuchs (Prac.:)
Autor:	Ali Bin Selamat (Prac.: CZAV)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)
Místo publikace:	Berlín
ISSN:	0302-9743
ISBN:	978-3-031-16013-4
Ročník:	13501 LNAI
Strany:	82-94
Abstrakt orig.:	This article addresses the issue of detecting traffic signs signalling cycle routes. It is also necessary to read the number or text of the cycle route from the given image. These tags are kept under the identifier IS21 and have a defined, uniform design with text in the middle of the tag. The detection was solved using the You Look Only Once (YOLO) model, which works on the principle of a convolutional neural network. The OCR tool PythonOCR was used to read characters from tags. The success rate of IS21 tag detection is 93.4%, and the success rate of reading text from tags is equal to 85.9%. The architecture described in the article is suitable for solving the defined problem. © 2022, The Author(s), under exclusive license to Springer Nature Switzerland AG.
Počet stran:	13
Odkazy:	https://link.springer.com/chapter/10.1007/978-3-031-16014-1_8?utm_source=getftr&utm_medium=getftr&utm_campaign=getftr_pilot
Hlavní klíč:	Computer vision; Machine learning; Object detection; OCR; YOLO; YOLOv5
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Cycle Route Signs Detection Using Deep Learning
Datum konání:	28.09.2022
Datum vložení:	01.11.2022
Financování:	S -

Pořadové číslo: 7/17

ID publikace:	43879182
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	A New Adaptive Mixture Distance-based Improved Density Peaks Clustering for Gearbox Fault Diagnosis
Rok publikace:	2022
Autor:	K.K. Sharma (Prac.:)
Autor:	A. Seal (Prac.:)
Autor:	A. Yazidi (Prac.:)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	IEEE Transactions on Instrumentation and Measurement
Místo publikace:	Piscataway
Číslo/kód:	October
ISSN:	0018-9456
Vydavatel:	IEEE
Ročník:	71
Strany:	"Article Number: 328716"
Abstrakt orig.:	With the rapid development of sensors and mechanical systems, we produce an exponentially large amount of data daily. Usually, faults are prevalent in these sensory systems due to harsh operational conditions. So, detecting and diagnosing faults in the gearbox of mechanical systems is done by analyzing an exponentially large amount of data in the form of vibration signals and categorical features. However, the automatic fault detection method can match the increasing requirement for high-quality products in the course of intelligent manufacture. Thus, to acquire more distinguishable fault features under varied conditions, a new adaptive mixture distance-based simple and efficient density peaks clustering algorithm is proposed for handling mixed data as real-world datasets encompassing both numerical and categorical attributes. Our approach revolves around the concept of a sequence of the weighted exponential kernel using a symmetry-favored c-nearest neighbor to estimate the global parameter and the local density of each data point. Then, the initial clusters are extracted from a decision graph using an adaptive threshold parameter. The final step is to allocate the remaining data objects, if they are density reachable, to either of the initial groups. Thirteen UCI datasets and one real-world dataset from a mechanical system for gearbox defect diagnosis are employed to validate the proposed method. Five external and two internal evaluation criteria are considered to gauge how well the strategies are working. All of the findings indicate that the proposed method outperforms thirteen other approaches. IEEE
Počet stran:	16
Odkazy:	https://ieeexplore.ieee.org/document/9926129
Hlavní klíč:	Clustering algorithms; Computer science; Density peaks clustering; Feature extraction; Indexes; Kernel; Mechanical systems; mixed data; S-distance; symmetric favored –nearest neighbors; Vibrations
Jazyk (originál):	angličtina (eng)
Titul anglicky:	A New Adaptive Mixture Distance-based Improved Density Peaks Clustering for Gearbox Fault Diagnosis
Datum vložení:	04.11.2022
Financování:	S -

Pořadové číslo: 8/17

ID publikace:	43879239
Stav:	Přijatý
Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	Evaluation of Bit String Fast Reroute Mechanism
Rok publikace:	2022
Autor:	J. Panan (Prac.:)
Autor:	J. Dobrota (Prac.:)
Autor:	I. Bridova (Prac.:)
Autor:	P. Brida (Prac.:)
Autor:	J. Machai (Prac.:)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	INES 2022 - 26th IEEE International Conference on Intelligent Engineering Systems 2022, Proceedings
Místo publikace:	New Jersey
ISSN:	1543-9259
ISBN:	978-1-66549-209-6
Strany:	47-51
Abstrakt orig.:	One of the leading security aspects of a computer network is reliability. However, in a modern Internet Protocol (IP) network, when line or node failure occurs, the process of network convergence begins. As a result, users may experience data loss, service unavailability, and other negative impacts during this process. The paper describes an evaluation of the modern Fast ReRoute (FRR) mechanism Bit-Repair (B-REP) that uses the Bit-String field to define hop-by-hop an alternative backup FRR path. The mechanism provides advanced protection against multiple outages of lines or nodes in the network domain. Implementation of the mechanism into the discrete event simulation environment OMNeT++ and its evaluation are presented in the paper. Finally, the proposed mechanism was tested in various simulation scenarios with multiple network topologies. © 2022 IEEE.
Počet stran:	5
Odkazy:	https://ieeexplore.ieee.org/document/9922631/figures#figures
Hlavní klíč:	Bit-String; Fault Tolerance; FRR; INET; OMNeT++; OSPF; ReRoute
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Evaluation of Bit String Fast Reroute Mechanism
Datum konání:	12.08.2022
Datum vložení:	23.11.2022
Financování:	S -

Pořadové číslo: 9/17

ID publikace:	43879369
Stav:	Rozpracovaný
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Dynamics of a two-layer neuronal network with asymmetry in coupling
Rok publikace:	2023
Autor:	S. Sriram (Prac.:)
Autor:	H. Natiq (Prac.:)
Autor:	K. Rajagopal (Prac.:)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Autor:	Hamidreza Namazi (Prac.: CZAV)
Název zdroje:	Mathematical Biosciences and Engineering
Číslo/kód:	2
ISSN:	1547-1063
Vydání:	2
Ročník:	20
Strany:	2908-2919
Abstrakt orig.:	Investigating the effect of changes in neuronal connectivity on the brain's behavior is of interest in neuroscience studies. Complex network theory is one of the most capable tools to study the effects of these changes on collective brain behavior. By using complex networks, the neural structure, function, and dynamics can be analyzed. In this context, various frameworks can be used to mimic neural networks, among which multi-layer networks are a proper one. Compared to single-layer models, multi-layer networks can provide a more realistic model of the brain due to their high complexity and dimensionality. This paper examines the effect of changes in asymmetry coupling on the behaviors of a multi-layer neuronal network. To this aim, a two-layer network is considered as a minimum model of left and right cerebral hemispheres communicated with the corpus callosum. The chaotic model of Hindmarsh-Rose is taken as the dynamics of the nodes. Only two neurons of each layer connect two layers of the network. In this model, it is assumed that the layers have different coupling strengths, so the effect of each coupling change on network behavior can be analyzed. As a result, the projection of the nodes is plotted for several coupling strengths to investigate how the asymmetry coupling influences the network behaviors. It is observed that although no coexisting attractor is present in the Hindmarsh-Rose model, an asymmetry in couplings causes the emergence of different attractors. The bifurcation diagrams of one node of each layer are presented to show the variation of the dynamics due to coupling changes. For further analysis, the network synchronization is investigated by computing intra-layer and inter-layer errors. Calculating these errors shows that the network can be synchronized only for large enough symmetric coupling. ©2023 the Author(s).
Počet stran:	12
Odkazy:	http://www.aimspress.com/article/doi/10.3934/mbe.2023137
Hlavní klíč:	asymmetry coupling; attractor; multi-layer networks; neuronal network; synchronization
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Dynamics of a two-layer neuronal network with asymmetry in coupling
Datum vložení:	22.12.2022
Financování:	S -

Pořadové číslo: 10/17

ID publikace:	43878547
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	BOTNET DETECTION USING INDEPENDENT COMPONENT ANALYSIS
Rok publikace:	2022
Autor:	W.N.H. Ibrahim (Prac.:)
Autor:	M.S. Anuar (Prac.:)
Autor:	Ali Bin Selamat (Prac.: CZAV)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	IIUM Engineering Journal
Číslo/kód:	1
ISSN:	1511-788X
Vydání:	1
Ročník:	23
Strany:	95-115
Abstrakt orig.:	Botnet is a significant cyber threat that continues to evolve. Botmasters continue to improve the security framework strategy for botnets to go undetected. Newer botnet source code runs attack detection every second, and each attack demonstrates the difficulty and robustness of monitoring the botnet. In the conventional network botnet detection model that uses signature-analysis, the patterns of a botnet concealment strategy such as encryption & polymorphic and the shift in structure from centralized to decentralized peer-to-peer structure, generate challenges. Behavior analysis seems to be a promising approach for solving these problems because it does not rely on analyzing the network traffic payload. Other than that, to predict novel types of botnet, a detection model should be developed. This study focuses on using flow-based behavior analysis to detect novel botnets, necessary due to the difficulties of detecting existing patterns in a botnet that continues to modify the signature in concealment strategy. This study also recommends introducing Independent Component Analysis (ICA) and data pre-processing standardization to increase data quality before classification. With and without ICA implementation, we compared the percentage of significant features. Through the experiment, we found that the results produced from ICA show significant improvements. The highest F-score was 83% for Neris bot. The average F-score for a novel botnet sample was 74%. Through the feature importance test, the feature importance increased from 22% to 27%, and the training model false positive rate also decreased from 1.8% to 1.7%. © 2022. IIUM Engineering Journal. All Rights Reserved.
Počet stran:	21
Odkazy:	https://journals.iium.edu.my/ejournal/index.php/iiumej/article/view/1789
Hlavní klíč:	Botnet detection; Flow-based; Independent component analysis; Machine learning; Traffic analysis
Jazyk (originál):	angličtina (eng)
Titul anglicky:	BOTNET DETECTION USING INDEPENDENT COMPONENT ANALYSIS
Datum vložení:	29.01.2022
Financování:	S -

ID publikace:	43878638
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Deep Learning for Phishing Detection: Taxonomy, Current Challenges and Future Directions
Rok publikace:	2022
Autor:	N.Q. Do (Prac.:)
Autor:	Ali Bin Selamat (Prac.: CZAV)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Autor:	E. Herrera-Viedma (Prac.:)
Autor:	H. Fujita (Prac.:)
Název zdroje:	IEEE Access
Místo publikace:	Piscataway
Číslo/kód:	February
ISSN:	2169-3536
Vydavatel:	IEEE
Ročník:	10
Strany:	36429-36463
Abstrakt orig.:	Phishing has become an increasing concern and captured the attention of end-users as well as security experts. Despite decades of development and improvement, existing phishing detection techniques still suffer from the deficiency in performance accuracy and the inability to detect unknown attacks. Motivated to solve these problems, many researchers in the cybersecurity domain have shifted their attention to phishing detection that capitalizes on machine learning techniques. In recent years, deep learning has emerged as a branch of machine learning that has become a promising solution for phishing detection. As a result, this study proposes a taxonomy of deep learning algorithms for phishing detection by examining 81 selected papers using a systematic literature review approach. The paper first introduces the concept of phishing and deep learning in the context of cybersecurity. Then, phishing detection and deep learning algorithm taxonomies are provided to classify the existing literature into various categories. Next, taking the proposed taxonomy as a baseline, this study comprehensively reviews the state-of-the-art deep learning techniques and analyzes their advantages as well as disadvantages. Subsequently, the paper discusses various issues deep learning faces in phishing detection and proposes future research directions to overcome these challenges. Finally, an empirical analysis is conducted to evaluate the performance of various deep learning techniques in a practical context and highlight the related issues that motivate researchers in their future works. The results obtained from the empirical experiment showed that the common issues among most of the state-of-the-art deep learning algorithms are manual parameter-tuning, long training time, and deficient detection accuracy. Author
Počet stran:	35
Odkazy:	https://ieeexplore.ieee.org/document/9716113
Hlavní klíč:	Classification algorithms; Cybersecurity; Deep learning; deep learning; Feature extraction; machine learning; Manuals; Phishing; phishing detection; Systematics; Taxonomy
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Deep Learning for Phishing Detection: Taxonomy, Current Challenges and Future Directions
Datum vložení:	05.03.2022
Financování:	S -

Pořadové číslo: 12/17

ID publikace:	43878713
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Deep transfer learning based photonics sensor for assessment of seed-quality
Rok publikace:	2022
Autor:	Thakur P. Singh (Prac.:)
Autor:	B. Tiwari (Prac.:)
Autor:	A. Kumar (Prac.:)
Autor:	B. Gedam (Prac.:)
Autor:	Vimal Bhatia (Prac.: 2900)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Autor:	Michal Dobrovolný (Prac.: CZAV)
Autor:	J. Nebhen (Prac.:)
Autor:	S. Prakash (Prac.:)
Název zdroje:	Computers and Electronics in Agriculture
Číslo/kód:	May
ISSN:	0168-1699
Ročník:	196
Strany:	"Article number: 106891"
Abstrakt orig.:	Seed-quality is one of the most important factors for achieving the objectives of uniform seedling establishment and high crop yield. In this work, we propose laser backscattering and deep transfer learning (TL) based photonics sensor for automatic identification and classification of high-quality seeds. The proposed sensor is based on capturing a single backscattered image of a seed sample and processing the acquired images by using deep learning (DL) based algorithms. Advantages of the proposed sensor include its ability to characterize morphological and biological changes related to seed-quality, lower memory requirement, robustness against external noise and vibration, easy alignments, and low complexity of acquisition and processing units. Furthermore, use of DL based processing frameworks including convolution neural network (CNN) and various TL models (VGG16, VGG19, InceptionV3, and ResNet50) extract abstract features from the images without any additional image processing and accelerate classification efficiency. Obtained results indicate that all the DL models performed significantly well with higher accuracy; however, InceptionV3 outperformed rest of the models with accuracy reaching up to 98.31%. To validate performance of the proposed sensor standard quality parameters comprising percentage imbibition (PI), radicle length, and germination percentage (GP) were also calculated. Significant change ($p < 0.05$) in these parameters show that the proposed sensor can accurately monitor the quality of seeds with higher accuracy. Moreover, experimental simplicity and DL based automatic classification make the sensor suitable for real-time applications. © 2022 Elsevier B.V.
Počet stran:	10
Odkazy:	https://linkinghub.elsevier.com/retrieve/pii/S0168169922002083
Hlavní klíč:	Agriculture; Convolution neural network; Deep learning; Photonics; Seed-quality; Speckle; Transfer learning
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Deep transfer learning based photonics sensor for assessment of seed-quality
Datum vložení:	11.04.2022
Financování:	S -

ID publikace:	43878811
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Outage probability minimization based power control and channel allocation in underlay D2D-NOMA for IoT networks
Rok publikace:	2022
Autor:	J. Jose (Prac.:)
Autor:	A. Agarwal (Prac.:)
Autor:	Vimal Bhatia (Prac.: DěkFIM)
Autor:	Ondřej Krejcar (Prac.: CZAV)
Název zdroje:	Transactions on Emerging Telecommunications Technologies
Číslo/kód:	9
ISSN:	2161-3915
Ročník:	33
Strany:	"Article Numbere: 4568"
Abstrakt orig.:	The emergence of Internet-of-Things (IoT) aims to improve modern life by inter-connecting many smart devices, technologies, and applications. It, however, drastically increases mobile traffic and requires large wireless spectrum. Therefore, for a better spectrum utilization to support this massive connectivity along with low latency and close proximity based communication, non-orthogonal multiple access enabled underlay device-to-device (D2D-NOMA) is envisioned as a key technology for IoT deployment. Hence, in this work, we consider multiple IoT clusters communicating via underlay D2D-NOMA in an uplink cellular network, with the objective of minimizing the outage probability (OP) while allocating resources to the clusters. Specifically, for each cluster, we formulate the optimization problem of OP-based power control with fixed channel allocation (PCCA) and solve it using particle swarm optimization (PSO). Additionally, we prove the convexity of PCCA problem and obtain closed-form expressions at high SNR. Further, we propose a novel OP-aware channel allocation (OPCA) algorithm to enhance the overall D2D network outage performance. The results are numerically validated and an average performance improvement of 31% and 51% is observed over the two conventional schemes namely fixed power allocation and orthogonal multiple access enabled D2D, respectively. © 2022 John Wiley & Sons, Ltd.
Počet stran:	15
Odkazy:	https://onlinelibrary.wiley.com/doi/10.1002/ett.4568
Hlavní klíč:	Outage; probability; minimization; based; power; control; and; channel; allocation; underlay; D2D-NOMA; for; IoT; networks
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Outage probability minimization based power control and channel allocation in underlay D2D-NOMA for IoT networks
Datum vložení:	13.06.2022
Financování:	S -

Pořadové číslo: 14/17

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Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	An Improved Ensemble Deep Learning Model Based on CNN for Malicious Website Detection
Rok publikace:	2022
Autor:	N.Q. Do (Prac.:)
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Autor:	Ondřej Krejcar (Prac.: CZAV)
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ISBN:	978-3-031-08529-1
Ročník:	13343 LNAI
Strany:	497-504
Abstrakt orig.:	A malicious website, also known as a phishing website, remains one of the major concerns in the cybersecurity domain. Among numerous deep learning-based solutions for phishing website detection, a Convolutional Neural Network (CNN) is one of the most popular techniques. However, when used as a stand-alone classifier, CNN still suffers from an accuracy deficiency issue. Therefore, the main objective of this paper is to explore the hybridization of CNN with another deep learning algorithm to address this problem. In this study, CNN was combined with Bidirectional Gated Recurrent Unit (BiGRU) to construct an ensemble model for malicious webpage classification. The performance of the proposed CNN-BiGRU model was evaluated against several deep learning approaches using the same dataset. The results indicated that the proposed CNN-BiGRU is a promising solution for malicious website detection. In addition, ensemble architectures outperformed single models as they joined the advantages and cured the disadvantages of individual deep learning algorithms. © 2022, Springer Nature Switzerland AG.
Počet stran:	8
Odkazy:	https://link.springer.com/chapter/10.1007/978-3-031-08530-7_42
Hlavní klíč:	Bidirectional Gated Recurrent Unit (BiGRU); Convolutional Neural Network (CNN); Cybersecurity; Deep learning (DL); Malicious website; Phishing detection
Jazyk (originál):	angličtina (eng)
Titul anglicky:	An Improved Ensemble Deep Learning Model Based on CNN for Malicious Website Detection
Datum konání:	19.07.2022
Datum vložení:	27.09.2022
Financování:	S -

Pořadové číslo: 15/17

ID publikace:	43879051
Stav:	Přijatý
Literární forma:	D_ČLÁNEK VE SBORNÍKU
Rozšíření LiF:	D_Článek ve sborníku
Titul (v originále):	WHTE: Weighted Hoeffding Tree Ensemble for Network Attack Detection at Fog-IoMT
Rok publikace:	2022
Autor:	S.S. Hameed (Prac.:)
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Autor:	L.A. Latiff (Prac.:)
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Název zdroje:	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)
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ISBN:	978-3-031-08529-1
Ročník:	13343 LNAI
Strany:	485-496
Abstrakt orig.:	The fog-based attack detection systems can surpass cloud-based detection models due to their fast response and closeness to IoT devices. However, current fog-based detection systems are not lightweight to be compatible with ever-increasing IoMT big data and fog devices. To this end, a lightweight fog-based attack detection system is proposed in this study. Initially, a fog-based architecture is proposed for an IoMT system. Then the detection system is proposed which uses incremental ensemble learning, namely Weighted Hoeffding Tree Ensemble (WHTE), to detect multiple attacks in the network traffic of industrial IoMT system. The proposed model is compared to six incremental learning classifiers. Results of binary and multi-class classifications showed that the proposed system is lightweight enough to be used for the edge and fog devices in the IoMT system. The ensemble WHTE took trade-off between high accuracy and low complexity while maintained a high accuracy, low CPU time, and low memory usage. © 2022, Springer Nature Switzerland AG.
Počet stran:	12
Odkazy:	https://link.springer.com/chapter/10.1007/978-3-031-08530-7_42
Hlavní klíč:	Attack detection; Incremental ensemble classifier. Fog-computing; Intrusion detection; Machine learning
Jazyk (originál):	angličtina (eng)
Titul anglicky:	WHTE: Weighted Hoeffding Tree Ensemble for Network Attack Detection at Fog-IoMT
Datum konání:	19.07.2022
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Pořadové číslo: 16/17

ID publikace:	43879065
Stav:	Přijatý
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	Jimp
Titul (v originále):	Power controlled outage-aware optimal protocol for NOMA-assisted underlay D2D network
Rok publikace:	2022
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Název zdroje:	AEU - International Journal of Electronics and Communications
Číslo/kód:	December
ISSN:	1434-8411
Ročník:	157
Strany:	"Article number: 154418"
Abstrakt orig.:	Underlay device-to-device (D2D) and non-orthogonal multiple access (NOMA) are two promising technologies that have potential to enhance the spectral efficiency for future wirel communication systems. This paper studies an underlay D2D-NOMA system in an uplink cellular network. Different from the previous works, we minimize the outage probability (OP while allocating optimal power to the D2D group receivers. Specifically, a D2D power allocation (DPA) problem is formulated and a globally-optimal solution is obtained. As a special case, closed-form expressions are also derived for asymptotic OP-based DPA. Result are numerically validated, and an overall average performance improvement of at least 24% observed over existing conventional power control schemes. © 2022 Elsevier GmbH
Počet stran:	5
Odkazy:	https://www.sciencedirect.com/science/article/pii/S1434841122002886?pes=vor
Hlavní klíč:	NOMA; Outage; Power allocation; Underlay D2D
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Power controlled outage-aware optimal protocol for NOMA-assisted underlay D2D network
Datum vložení:	04.10.2022
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ID publikace:	43879090
Stav:	Rozpracovaný
Literární forma:	J_ČLÁNEK V ODBORNÉM PERIODIKU
Rozšíření LiF:	J_Článek v odborném periodiku
Titul (v originále):	Benchmarks for machine learning in depression discrimination using electroencephalography signals
Rok publikace:	2022
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Název zdroje:	Applied Intelligence
Místo publikace:	DORDRECHT
ISSN:	0924-669X
Vydavatel:	Springer
Abstrakt orig.:	Diagnosis of depression using electroencephalography (EEG) is an emerging field of study. When mental health facilities are unavailable, the use of EEG as an objective measure for depression management at an individual level becomes necessary. However, the limited availability of the openly accessible EEG datasets for depression and the non-standard task paradigm confine the scope of the research. This study contributes to the area by presenting a dataset that includes EEG data of subjects in the resting state and Patient Health Questionnaire (PHQ)-9 scores. These recordings incorporate EEG signals under both eyes open (EO) and eyes closed (EC) conditions. Moreover, this work documents high performance on various benchmark depression classification tasks with the help of traditional supervised machine learning algorithms, namely Decision Tree, Random Forest, k-Nearest Neighbours, Naive Bayes, Support Vector Machine, Multi-Layer Perceptron, and extreme gradient boosted trees (XGBoost) using the newly created dataset, where the class label of each patient is determined by the PHQ-9 score of the person. Then, feature selection is performed on twenty-three linear, nonlinear, time domain, and frequency domain features using ANOVA test and correlation analysis to identify statistically significant features, which are further fed into algorithms mentioned above separately for distinguishing healthy subjects from depressed. Among these classifiers, the performance of the XGBoost is found to be the best, with an accuracy of 87% for the EO state. The obtained results demonstrate that the proposed method outperforms fourteen existing approaches. The dataset presented in this work can be downloaded via https://drive.google.com/drive/folders/1ANUC-6hq02QG728ZWv2a1UWTLUbRrq y?usp=sharing.
Počet stran:	18
Odkazy:	https://link.springer.com/article/10.1007/s10489-022-04159-y
Hlavní klíč:	Depression analysis; Electroencephalography; Signal processing; Feature extraction; Feature selection; Pattern classification
Jazyk (originál):	angličtina (eng)
Titul anglicky:	Benchmarks for machine learning in depression discrimination using electroencephalography signals
Datum vložení:	12.10.2022
Financování:	I -
Financování:	S -