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Eszter Lukács IEEE Client Services Manager







How to find a Topic for my Thesis? IEEE Xplore Database Research

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IEEE PES Scholar Razan Ghabin, an undergrad at Texas A&M, working on a water purification project in EL Salvador





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IEEE Conferences Continue to Address Growing Areas of Research in New and Emerging Technologies

IEEE conferences continue to address growing areas of research that transform our lives. Below are some examples of conferences published in 2021 covering these innovative technologies:

- 2021 IEEE International Solid-State Circuits Conference (ISSCC)
- 2021 4th International Conference on Artificial Intelligence and Big Data
- 2021 IEEE 93rd Vehicular Technology Conference (VTC2021-Spring)



- 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
- 2021 32nd Annual SEMI Advanced Semiconductor Manufacturing Conference (ASMC)
- 2021 7th International Conference on Automation, Robotics and Applications (ICARA)
- 2021 IEEE 2nd International Conference on Big Data, AI, and Internet of Things Engineering
- 2021 IEEE International Conference on Blockchain and Cryptocurrency (ICBC)
- 2021 8th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)
- 2021 Sixteenth International Conference on Ecological Vehicles and Renewable Energies
- 2021 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT)
- 2021 5th International Conference on Internet of Things and Applications (IoT)





The top-cited publications in the field are in IEEE *Xplore*

Journal Citation Reports[®] by Impact Factor

Each year, the Journal Citation Reports[®] (JCR) from Clarivate Analytics examines the impact of scholarly journals by determining how often a journal's articles are cited by later research. are:

- 27 of the top 30 journals in EE
- 21 of the top 25 journals in Telecommunications
- All of the top 5 journals in Automation and Control Systems
- 4 of the top 5 journals in Computer Science—Information Systems
- 4 of the top 5 journals in Computer Science—Hardware & Architecture
- 3 of the top 5 journals in Computer Science—Artificial Intelligence
- 3 of the top 5 journals in Computer Science—Cybernetics
- 3 of the top 5 journals in Computer Science—Software Engineering
- 3 of the top 5 journals in Imaging Science & Photographic Technology
- 3 of the top 5 journals in Transportation Science & Technology

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IEEE TRANSACTIONS ON



A PUBLICATION OF THE IEEE GEOSCIENCE AND REMOTE SENSING SOCIET



Source: 2019 Journal Citation Reports (Clarivate Analytics, 2018) Based on the 2017 study, released June 2020

Journal Citation Reports present quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals.

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Selecting A Research Topic

Choose An Area You Are Interested In

The research process is more relevant if you care about your topic.

Introduction to the Topic

Reading a **broad summary** enables you to get an **overview** of the topic and see how your idea relates to broader, narrower, and related issues.

Background Study

Background reading can help you choose and **limit the scope** of your topic as well as determine if there is a **research gap**.





Choose An Area You Are Interested In



IEEE Resources to help select a research area

- New Technology Connections: IEEE Future Directions <u>https://www.ieee.org/about/technologies.html</u>
- IEEE Spectrum Magazine <u>https://spectrum.ieee.org/</u>
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IEEE Future Directions' New Initiatives











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2022

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IEEE Future Directions' Small Projects



Fields of Interest: Smart Lighting systems Technology; Visual Light Communication and Protocols; Connected and Communicating Lighting Systems; Lighting systems for smart cities, smart buildings, smart transport; Smart Lighting Standards; Human-centric Lighting; Illumination impacts (human being, ecosystem, energy, environment, natural resources); Lighting systems for developing countries; Lighting Industry Development and consumer satisfaction; Train for Lighting and Illumination.



Technical Activities: Coordinate/Engage with small satellites (CubeSats) global development, Develop Ground Stations to operate the satellites, Network the Ground Stations



Fields of Interest: Accelerate the missing technology components and encourage integrated telepresence systems. Create new interfaces for teleoperations. Operate/manipulate equipment as if present in cabin/control room. Move heavy equipment, drive agricultural machines, perform tele-medicine.

https://cmte.ieee.org/futuredirections/ieee-future-directions-new-technology-proposal-list/

IEEE Spectrum Magazine Website

A good source of inspiration





IEEE Spectrum Magazine: Annual Top Tech Issue

Look Out for Apple's AR Glasses

With head-up displays, cameras, inertial sensors, and lidar on board, Apple's augmentedreality glasses could redefine wearables

Deep Learning at the Speed of Light

Lightmatter bets that optical computing can solve Al's efficiency problem This Is How to Vaccinate the World

We can manufacture and distribute enough doses to protect humanity from COVID-19

Where No One Has Seen Before

The James Webb Space Telescope will let us see back almost to the big bang



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IEEE Xplore: Trending Search Terms & Content





Trending Search Terms

Top Searches and Matching Documents @



X

Trending Search Terms

Top Searches and Popular Content

Top Search Terms 😯	Graphic	List	
1. machine learning		11. Big Data	21. ISSCC
2. IoT		12. VLSI	22. Reinforcement Learn
3. Artificial Intelligence		13. UAV	23. NOMA
4. Image Processing		14. Smart Grid	24. 6G
5. Cloud Computing		15. Face Recognition	25. Computer Vision
6. 5G		16. AI	
7. Deep Learning		17. Edge Computing	
8. Blockchain		18. Cyber Security	
9. Antenna		19. Object Detection	
10. Data Mining		20. FPGA	

Additional Tips for Selecting a Research Area

- Review the <u>topic selection guidelines</u> outlined in your assignment
- Ask your professor or teaching assistant for suggestions
- Hold a <u>brainstorming</u> session with your classmates



DEEP LEARNING



https://www.ieee.org/conferences/

IEEE Conference Search Results

ICICM



2022 IEEE International Conference on Image Processing, Computer Vision and Machine Learning (ICICML2022)

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Image processing:	Computer vision:	Machine learning:
Pattern recognition and analysis	Big data and computer vision	Intelligent data analysis
Face recognition	Biometrics, biomedical image analysis	Modeling and identification
Image feature extraction	Remote sensing image	Multitasking and migration study
Image processing	Computational photography	Machine learning algorithms
Image segmentation	Optimization and method of study	Deep learning
Object recognition	Sensor and display	Artificial intelligence

Introduction to the Topic



Search IEEE Xplore for "deep learning"





The Difference Between a Magazine and a Journal

IEEE magazines articles fall into three main categories:

•Features: Technical research articles, tutorials, and non-technical general-interest articles

•**Reviews:** Reviews of technical books and new products

•Columns and departments: Editorials, society and industry news, technology perspectives, conference updates, profiles, interviews, and event calendars

Magazines are different than journals in significant ways:

•Feature articles are shorter, with a broader appeal and fewer equations and references.

•Articles are more **tutorial** in nature. Articles are written **to appeal to nonexperts as well as experts in the field**.

•Magazines look different, with visually appealing covers and photographs throughout the issue.



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Books (166)	□ Courses (2)		
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Show	Select All on Page	Sort By:	Relevance ▼
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Year 🗸	Abstract HTML 📙 ©		
Author 🗸	Evaluation of Deep Learning Technic	ques in Sentiment Analysis from Twitter Data	-f
Affiliation V	Dionysis Goularas; Sani Kamis 2019 International Conference on Deer	• Learning and Machine Learning in Emerging App	lications
Publication Title	(Deep-ML) Year: 2019 Conference Paper Pub Cited by: Papers (13)	isher: IEEE	



Scroll through the Search Results

Learning IoT in Edge: Deep Learning for the Internet of Things with Edge Computing

He Li; Kaoru Ota; Mianxiong Dong

IEEE Network

Year: 2018 | Volume: 32, Issue: 1 | Magazine Article | Publisher: IEEE Cited by: Papers (324)

Deep Learning in Remote Sensing: A Comprehensive Review and List of Resources

Xiao Xiang Zhu; Devis Tuia; Lichao Mou; Gui-Song Xia; Liangpei Zhang; Feng Xu; Friedrich Fraundorfer

IEEE Geoscience and Remote Sensing Magazine

Year: 2017 | Volume: 5, Issue: 4 | Magazine Article | Publisher: IEEE Cited by: Papers (283)

Deep Learning for Physical-Layer 5G Wireless Dechniques: Opportunities, Challenges and Solutions

Hongji Huang; Song Guo; Guan Gui; Zhen Yang; Jianhua Zhang; Hikmet Sari; Fumiyuki Adachi IEEE Wireless Communications

Year: 2020 | Volume: 27, Issue: 1 | Magazine Article | Publisher: IEEE Cited by: Papers (75)

The Future of Deep Learning & Photonic: Reducing the energy needs of neural networks might require computing with light

Ryan Hamerly

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IEEE Spectrum

Year: 2021 | Volume: 58, Issue: 7 | Magazine Article | Publisher: IEEE

Topics: Internet of Things Edge Computing Remote Sensing 5G Photonics



Review the Publications Topic facet on the search results page

Publication Topics

Enter Topics

learning (artificial intelligence) (304)

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- neural nets (111)
- telecommunication computing (40)
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- convolutional neural nets (36)
- cloud computing (34)
- Internet of Things (31)
- feature extraction (31)
- 5G mobile communication (24)
- recurrent neural nets (24)
- optimisation (22)
- data analysis (18)
- deep learning (artificial intelligence) (18)
- computer vision (17)
- telecommunication traffic (17)
- Big Data (16)
- artificial intelligence (16)
- image classification (14)
- object detection (14)

Related Terms: Artificial Intelligence Neural Nets

Related Technologies: Internet of Things Cloud Computing Big Data 5G



Read the Introduction from a couple of magazine articles

The technique that has empowered these stunning developments is called deep learning, a term that refers to mathematical models known as artificial neural networks. Deep learning is a subfield of machine learning, a branch of computer science based on fitting complex models to data.

Deep learning, which is to say artificial neural networks with many hidden layers, is regularly stunning us with solutions to realworld problems. And it is doing that in more and more realms, including natural-language processing, fraud detection, image recognition, and autonomous driving. Indeed, these neural networks are getting better by the day. Broader Terms: Machine Learning Artificial Intelligence

Related Term: Artificial Neural Networks

Applications: Natural Language Processing Fraud Detection Image Recognition Autonomous Driving



Background Study



IEEE Xplore has a variety of search options

Global Search, Advanced Search, Command Search





IEEE *Xplore*: An Enhanced Search Experience

	Global Search	Advanced Search	Command Search
Boolean Operators (AND/OR/NOT)	Yes	Yes	Yes
Proximity Operators (NEAR/ONEAR)	Yes	Yes	Yes
Field Searching	Yes	Yes (using drop down menus)	Yes (using drop down menus)

Proximity Operators

Operator	Syntax	Find Results That
NEAR	<i>x</i> NEAR/# y	Match expression x within # words of y (x can appear before or after y)
		Example: implantable NEAR/5 cardiac
		Finds articles with the word <i>implantable</i> within five words
		of <i>cardiac</i> ; <i>cardiac</i> can come before or after <i>implantable</i>
ONEAR	<i>x</i> ONEAR/# y	Match expression x before and within # words of y
		Example: implantable ONEAR/5 cardiac
		Finds articles with the word <i>implantable</i> within five words of <i>cardiac</i> ;
		but <i>implantable</i> must come before <i>cardiac</i>
	Note: Comple	ex Boolean queries can be nested in proximity statements

EXAMPLE: ("self driving" OR autonomous) NEAR/2 (car OR vehicle)

Limit of 20 terms in a search clause (Items to the right of a Boolean operator)

AND

(health* OR medtech OR patient OR biomed* OR medical OR Search medicine)

Search

Clause

AND

(sensor OR biosensor OR acceleromet* OR wireless ORSearchmobile OR remote OR monitor OR biometric*)Clause

Stemming

- IEEE Xplore automatically finds pluralized nouns, verb tenses, and British/American spelling variations with some exceptions
- IEEE Xplore ANDs terms together by default
- To search for an exact phrase and turn off stemming, place the phrase within quotes



Wildcards

Character	Description
*	- Asterisk (*) represents a single character, multiple characters, or no characters
?	- Question mark (?) represents a single character

- Maximum number of wildcards per search: 7
- Minimum number of characters required to use a wildcard: 3
- Asterisk wildcards can be used at the beginning, middle, or end of a word EXAMPLES: *technology, wom*n, detect*
- Wildcards can also be used in phrased searches
 EXAMPLE: "software program*"

Search IEEE Xplore for "deep learning" AND photonic

Advanced Search @

|--|

Enter keywords and select fields.

Search Term	"	in	All Metadata	•	0
AND -	Search Term photonic	in	All Metadata	•	↑ ×
AND -	Search Term	in	All Metadata	•	↑ × +

Showing 1-25 of 304 for ("A	l Metadata":"deep learning") AND ("	All Metadata":photonic)×	
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Year 🗸	▶ Abstract HTML <u>大</u> 🧭		
Author 🗸	Data-driven Modeling Technique Danshi Wang: Yuchen Song: Min Z	for Optical Communications Based on Deep Lear	ning
Affiliation 🗸	2020 Asia Communications and Pr Information Photonics and Optical	notonics Conference (ACP) and International Conference Communications (IPOC)	nce on
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The Future of Deep Learning Is Photonic: Reducing the energy needs of neural networks might require computing with light

Publisher: IEEE

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Ryan Hamerly All Authors



 \bigcirc -- Accuracy & dynamic range of analog optical 133 / 1,000 Enter



Figures

Abstract

Document Sections

- I. Introduction
- II. Microgrid Control
- III. Integration Issue of Distributed Energy Resources
- IV. Strengths and Weaknesses of the Renewable Energy Sector
- V. Environmental and Socioeconomic Impacts of Renewable Energy
- VI. Grid-Connected PV Array

VII. Conclusion and Future Scopes

Abstract:

The importance of Microgrid has increased appreciably by the increasing demand of efficient green energy, clean, secure and sustainable electricity. Microgrid is a transformative architecture for the normal generation, adaptive and self-healing of electricity network. This article contributes a comprehensive review of the latest research in the area of advance control techniques and integration issue of distributed energy resources (DER) in the Microgrid. The distributed generators resources such as solar, wind, photovoltaic etc. has high penetration and its connection to the grid network through advance power electronics converters with energy storage devices, communication technologies and controllable loads, open new horizons for the successful development of Microgrid applications incorporated into power frameworks.

Published in: 2019 International Conference on Innovative Trends and Advances in Engineering and Technology (ICITAET)

 Date of Conference: 27-28 Dec. 2019

 Date Added to IEEE Xplore: 18 August 2020

 ▶ ISBN Information:

INSPEC Accession Number: 19892561 DOI: 10.1109/ICITAET47105.2019.9170223 Publisher: IEEE

Conference Location: Shegoaon, India

I. Introduction

SECTION VII. Conclusion and Future Scopes

Microgrid is usually composed of distributed energy resources, energy management system based controller, communication system, electric vehicle and demand response. This paper contributes a comprehensive and review of the recent control and integration issues of distributed energy resources with Microgrid. Microgrid may be connected islanded mode or on-grid mode for sustainable development and deals with economical, technical and environmental issues. The operation of Microgrid is to provide the optimal power flow in the distribution network. This paper addresses the different control technologies and different integration challenges such as power quality, reliability, resiliency of renewable energy resources with high Microgrid penetration and also explores current approaches used in Grid network. For the future scopes are, accelerated deployment of renewable energy technologies, cost reduction using incubating technologies with future potential, easier implementation and effective monitoring and maintenance, regular improvements in regulatory and policy initiative to promote renewable energy, subsidy support for government, developing and deploying financial instruments and strong monitoring and evaluation frameworks.



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Use a Mind Map or Concept Map to organize your findings and narrow in on your research question



Photonics & Deep Learning: Challenges

- Accuracy & dynamic range of analog optical calculations
 - Optical processors suffer from various sources of noise
 - The digital-to-analog and analog-to-digital converters used to get the data in and out are of limited accuracy
- Industry demands higher precision for neural-network training
 - Google's TPU is an example of 8-bit electronic deep-learning hardware
- Integrating optical components onto a chip



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Year	Cited by: Papers (2) Patents (1)
Single Year Range	Abstract HTML 🔀 ©
1936 2022	 Holistic Web Application Security Visualization for Multi-Project and Multi-Phase Dynamic Application Security Test Results
From To 1936 2022	Ferda Ozdemir Sönmez; Banu Günel Kiliç IEEE Access Year: 2021 Volume: 9 Journal Article Publisher: IEEE
Author 🗸	Cited by: Papers (1)
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Publication Title	 SecureComm 2007 Web and application security - Session 7 2007 Third International Conference on Security and Privacy in Communications Networks and the Workshops -
Publisher 🗸	SecureComm 2007 Year: 2007 Conference Paper Publisher: IEEE
Supplemental Items	▶Abstract 崖 ⓒ
 Datasets (10) Video (9) 	Aggregation process for implementation of application security management based on risk assessment
Code (4)	P. Nyrkov Anatoliy; F. Katorin Yuri; D. Gaskarov Vagiz; V. Kosyak Yana; V. Sauchev Aleksandr 2018 IEEE Conference of Russian Young Researchers in Electrical and Electronic Engineering (ElConRus) Year: 2018 Conference Paper Publisher: IEEE



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Holistic Web Application Security Visualization for Multi-Project and Multi-Phase Dynamic Application Security Test Results

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Ferda Özder	nir Sönmez 💿	; Banu Günel Kiliç 🕲	All Authors					
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Abstract	t	Abstract:						

Abstract	Abstract:							
Document Sections	As the number of web applications and the corresponding number and sophistication of the threats increases, creating new tools that are efficient and accessible becomes essential. Although there is much research concentrating on network security							
I. Introduction	visualizations, there are only a few studies considering the web application vulnerabilities' possible visualization options.							
II. Related Work	vulnerability monitoring. This study forms a generic data struc	Jonsequentity, to fill this gap, this research centers around a novel perception configuration to improve web application vulnerability monitoring. This study forms a generic data structure based on data sources that might be readily associated and						
III. Process Description	commonly available for the majority of the web applications. T visualizing dynamic application security test results. Another c	he primary contribution of this study is a new dashboard tool for ontribution is the metrics/measures that the tool presents. The						
IV. Holistic Web Application	paper also describes a validation study in which participants a	nswered quiz questions upon using the tool prototype. For the						
Security Vulnerability	case study, sample data has been generated using the OWAS	P ZAP scanner tool and a prototype has been implemented to be						
Visualization, HWAS-V	used for validation purposes. This study allows the investigation of fifty metrics/measures for the multi-project/phase							
V. Case Study and HWAS-V	environment that enhances its benefits if the user aims to monitor a series of analyses' results and the changes between them for more than one web project.							
Show Full Outline -								
Authors	Published in: IEEE Access (Volume: 9)							
Figures	Page(s): 25858 - 25884	INSPEC Accession Number: 20324445						
References	Date of Publication: 04 February 2021 ?	DOI: 10.1109/ACCESS.2021.3057044						

Publisher: IEEE



Access Figures Within an Article

Abstract

I. Introduction

II. Related Work

Document Sections



The state of web application vulnerabilities between 2016 and 2019 [3] 1.



Visualization, HWAS-V





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Right Click on Equations: Copy Source Code and Zoom In

The rapid risk assessment is based on the calculation and evaluation of the risk index R.



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<math xmlns="http://www.w3.org/1998/Math/MathML" display="block">

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</mtd>

<mtd>

<mtock</mtock</pre>
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Access References and Citations

Abstract	References
Document Sections	Citation Map
I. Introduction	 K. A. Demir, "A survey on challenges of software project management" in Software Engineering Research and Practice, Las Vegas, NV, USA:Stylus Publishing, 2009.
II. Related Work	▶ Show in Context Google Scholar
III. Process Description	2. B. Molnar and A. Tarcsi, "Architecture and system design issues of contemporary web-based information systems", Proc.
IV. Holistic Web Application	5th Int. Conf. Softw. Knowl. Inf. Ind. Manage. Appl. (SKIMA), pp. 1-8, Sep. 2011.
Security Vulnerability Visualization, HWAS-V	Show in Context View Article Full Text: PDF (146KB) Google Scholar
V. Case Study and HWAS-V	3. The State of Web Application Vulnerabilities in 2019, Jan. 2020, [online] Available: https://www.imperva.com/blog/the-
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Biography

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