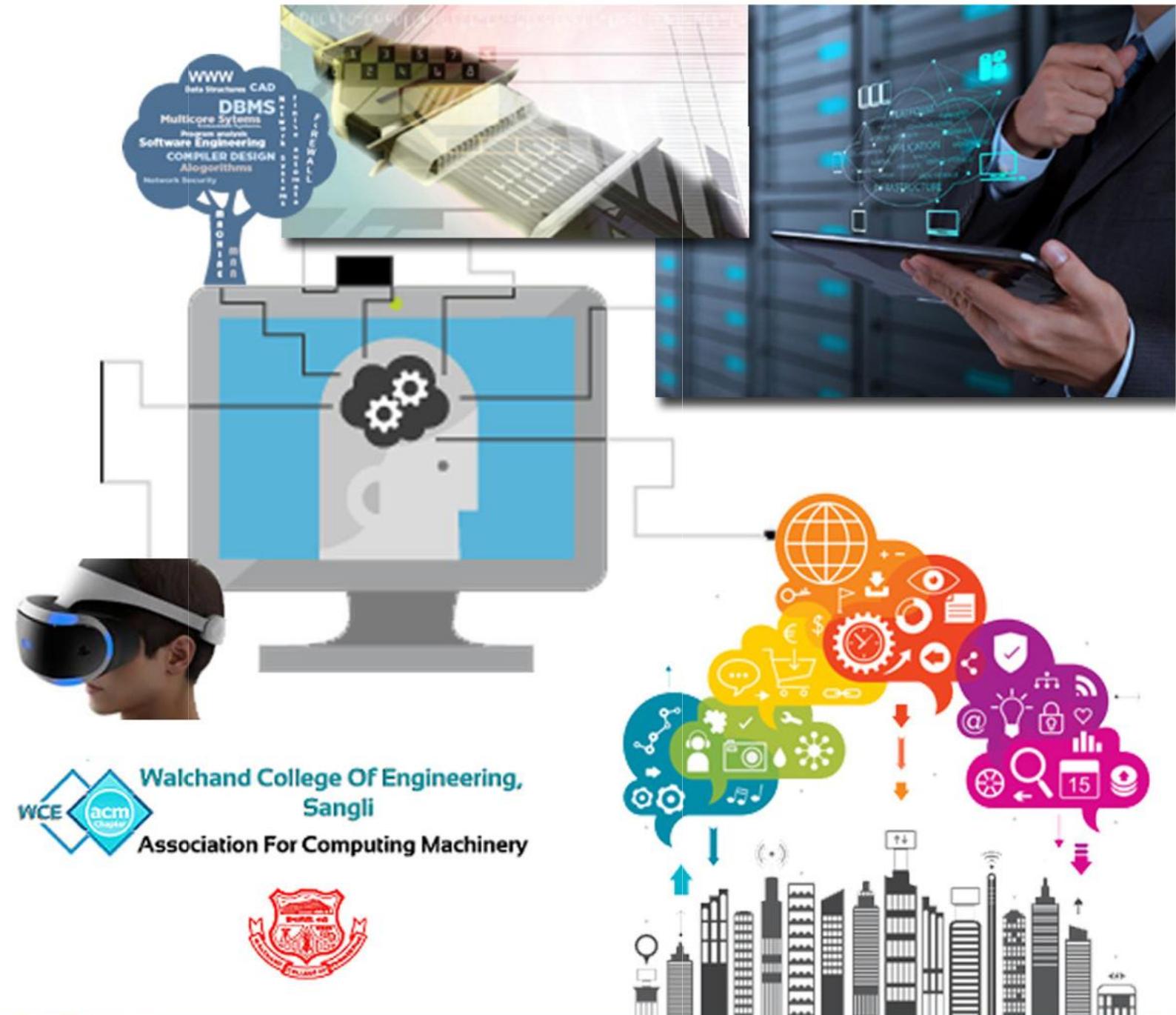
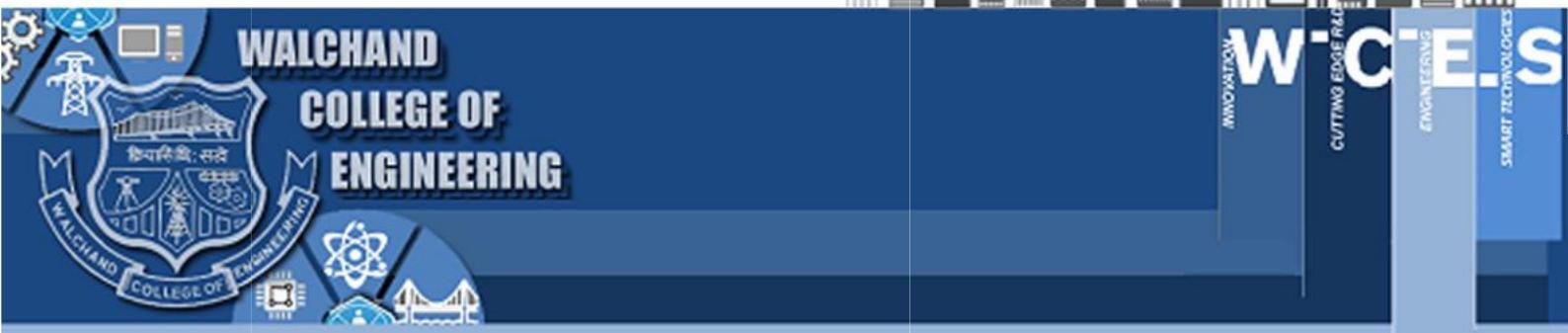


2nd National Research Symposium on Computing - RSC 2017

Jointly organized by
WCE ACM Student Chapter,
Department of Computer Science & Engineering and Department of Information Technology
Walchand College of Engineering, Sangli.



Walchand College Of Engineering,
Sangli
Association For Computing Machinery



**Collection of Abstracts
Of
2nd National Research Symposium on Computing
(RSC- 2017)
15th and 16th December, 2017**

Editor

Dr. P. J. Kulkarni

Deputy Director & Chair RSC- 2017



Jointly organized by

WCE ACM student chapter

Department of Computer Science and Engineering

&

Department of Information Technology

Walchand College of Engineering

(A Government Aided Autonomous Institute)

Vishrambag, Sangli-416415, Maharashtra, India

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PREFACE



Dr. G. V. Parishwad
Director, WCE Sangli



Dr. P. J. Kulkarni
Dy. Director, WCE Sangli

In Higher and Technical Education system, faculty members with higher research qualifications, especially in Information Communication and Technology (ICT) area, have to accept an important challenge of producing more number of researchers who in long run will take up responsibility of educating masses on design and use of modern technological gadgets for betterment of mankind. Over the last two decades, the growth of ICT products has been phenomenal. Rate of obsolescence of these ICT products is also significant. In order to cope with advancement of Engineering and Technology, researchers in the educational institutes need to brain storm, exchange their ideas with peer groups and make their research more fruitful. In line with this theme, Computer Science & Engineering Department and Information Technology Department of Walchand College of Engineering (WCE) proposed for holding of symposium in Computing. With constant proactive efforts of faculty members of these departments, the symposium scheduled in December 2017 has taken up a good shape for its organization. WCE has also been recognized to conduct Ph.D. research programme under Quality Improvement Programme (QIP) of AICTE. Along with this, Technical Education Quality Improvement Programme (TEQIP), being implemented in its phase II at WCE has one of the important components of promoting research culture among the budding engineers and faculty members. Therefore the organization of the symposium attracted a very good support from TEQIP. With very good response received from researchers for their paper presentations and with confirm availability of very good practicing researchers for delivery of key note speeches at the symposium, we are confident that the organization of the symposium will be a grand success. We would like to encourage all the participants of this symposium to take positive and active part in the deliberations at the symposium. On behalf of the college management, we wish them bright and fruitful career ahead.

Director

Walchand College of Engineering, Sangli

Deputy Director

WALCHAND COLLEGE OF ENGINEERING

(A Government Aided Autonomous Institute)

Walchand College of Engineering is situated midway between Sangli and Miraj cities at Vishrambag, Sangli. The WCE campus is located on about 90 acres of land on southern side of Sangli – Miraj road.

In 1947, the college made a modest beginning as New Engineering College, with a single program leading to B.E. (Civil) degree. In the year 1955, the College was renamed as Walchand College of Engineering as part of the new arrangements and pursuant to the Rehabilitation and Development Program mainly funded by Seth Walchand Hirachand Memorial Trust and the Government. The Government appointed an Ad Hoc Committee for conducting the college from May 1955, later replaced by the Administrative Council in 1956. The Ad Hoc Committee added two more degree programs in B.E. (Mechanical) and B.E. (Electrical) in 1955 with the intake of 20 each. Three Diploma programs also started in 1955 – Civil (40 intake), Mechanical (20) and Electrical (20).

Post Graduate programs in Civil, Mechanical and Electrical Engineering and Diploma program in Industrial Electronics were introduced in 1971. In 1986 the UG and PG programs in Electronics Engineering and UG program in Computer Science and Engineering were introduced.

PG program in CSE was introduced in 1997. In 2001, added B.E. program in Information Technology with an intake of 60 students. An additional intake of 30 students was also sanctioned for Computer Science & Engineering program, resulting in total intake of 390 students for all branches at UG level and 106 at PG level. As part of strategic planning, PG section is being strengthened and PG intake has now steadily risen to 240 across 10 programs. The College has a QIP scheme for full-time doctoral programs and also offers Ph. D. programs of Shivaji University in various branches of engineering.

Walchand College of Engineering became autonomous in 2007. The college revamped its academic structure and contents, in consultation with few US and IIT academic experts. Accordingly nomenclature of B.E and M.E programs has been changed to B Tech and M Tech programs. After completion of the first term of six years, the College has now received extension of autonomous status for the second term of six years till 2019-20. It participated in the World Bank funded, Government of India scheme, namely, Technical Education Quality Improvement Program (TEQIP) in Phase I from 2005-2009, wherein it stood all-India 2nd out of 127 participating institutions in terms of program impact performance. The college is presently participating in Phase II of TEQIP with outstanding performance.

From the desk of the Chair RSC 2017

Dr. P. J. Kulkarni

Dy. Director and Professor in CSE
Chair RSC 2017



Search and Research are continuous activities. Research culture in Computer Science and Engineering (CSE) at Walchand College of engineering (WCE), over last decade has seen significant positive growth. Year after year, more research outcomes are being strengthened. Quality Improvement Programme (QIP) of AICTE has instituted Ph D research center in CSE at WCE. Along with this, Shivaji University Kolhapur has already recognized the CSE department to conduct Ph D research programme. Association of Computing Machinery (ACM) also identified the CSE department to institute student chapter of ACM. The chapter activities are well progressing.

To further encourage CSE research activities, it is envisaged to create a platform to enable researchers in the field of CSE and allied to come together to provide critique on the ongoing research activities to enable shape these activities in a better way. In this direction, CSE Department and Information Technology (IT) department at WCE decided to jointly organize a “2nd National Research Symposium on Computing, RSC-2017”. The student chapter of ACM at WCE came forward to support the organization. At WCE, this is first of its kind of organization of the research symposium. Right from the day of its announcement, few months back, the organizing team of the conference started receiving very good responses from research community in CSE and IT. The research papers selected for the symposium are duly peer reviewed by outside research experts in the respective domains. The paper reviewing experts have technically well contributed by providing prompt and critical inputs to the authors of the papers. In order to provide good mentoring to the young researchers and attendees, the organizers of RSC-2016 are fortunate to attract good number of practicing researchers to deliver key note addresses. A pool of expert panel members will provide to the attendees of the

symposium a very good exposure to state-of-art in CSE, IT and allied fields. The entire focus of the symposium is to facilitate budding researchers to bring in innovations in their on-going research and make the research fruitful. Many of the participating researchers in the symposium are believed to have come from academic institutes, therefore various issues related to good practices in research methodologies, peer-to-peer sharing, widening contacts of like-minded researchers, presentations of research work, Intellectual Property Rights (IPR) etc. will be well deliberated.

I am very much confident that the symposium will mark significant achievement for all attendees of the symposium in practicing quality research work. I wish each one of them excellent prospective research career in future.

Dr. P. J. Kulkarni

ORGANIZING COMMITTEE

1	Dr. P. J. Kulkarni	Professor - Department of Computer Science & Engineering, Deputy Director - Walchand College of Engineering, Sangli
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10	Dr. R. R. Rathod	Assistant Professor - Department of Information Technology, Walchand College of Engineering, Sangli
11	Prof. U. B. Chavan	Assistant Professor - Department of Information Technology, Walchand College of Engineering, Sangli
12	Prof. M. B. Narnaware	Assistant Professor - Department of Information Technology, Walchand College of Engineering, Sangli
13	Prof. Mrs. B. B. Shetty	Assistant Professor - Department of Information Technology, Walchand College of Engineering, Sangli

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Umakant Kulkarni	SDM College of Engineering, Dharwad

Program Schedule

Day 1: Friday, December 15, 2017

9.30 am to 10.00 am	Registration and Welcome Tea, Breakfast		
10.00 am to 10.20 am	Inauguration : Dr R. Venkateswaran SVP, IoT Solutions Pune		
10.20 am to 11.40 am	Keynote address -1 Dr. R. Venkateswaran Pune (ACM)		
11.15 am to 11.30 am	Tea Break		
11.40 am to 12.20 pm	Key note address -2: Dr. V C V Rao C DAC Pune		
12.30 pm to 1.00 pm	Inauguration (Tilak Hall)		
1.00 pm to 1.40 pm	Lunch break		
1.40 pm to 1.45 pm	Photo Session		
1.45 pm to 2.30 pm	Keynote Address – 3 Dr. Parag Kulkarni		
SESSION-1 BIG DATA/MACHINE LEARNING/DEEP LEARNING/WEB/DATA MINING/HIGH PERFORMANCE COMPUTING Chair : Dr. Parag Kulkarni Co-chair : Dr. R.R. Rathod			
2.30 pm to 2.50 pm Presentation – 01	Paper ID	Paper	Author
	08	Improved Genetic Particle Swarm Optimization and Feature Subset Selection for Extreme Learning Machine	Archana Kale and Shefali Sonavane
2.50 pm to 3.10 pm Presentation – 02	07	Requirements for an M-learning Software Framework for Smart Learning	Sudhindra Deshpande, Shrinivas Mangalwede and Padmavati Dandannavar
3.10 pm to 3.30 pm Presentation – 03	34	Factored Language Modeling	Arun Babhulgarkar and Shefali Sonavane
3.30 pm to 3.50 pm Presentation – 04	20	Architecture for Personalized Meta Search Engine	Nutan Borkar and Shrikant Kulkarni
3.50 pm to 4.10 pm Presentation – 05	06	Handling of Class Imbalanced Problem in Big Data Sets: An Experimental Evaluation(UCPMOT)	Sachin Patil, Shefali Sonavane

**SESSION 1 (Parallel)(POST GRADUATE LABORATORY 1 CSE DEPARTMENT)
BIG DATA/MACHINE LEARNING/DEEP LEARNING/WEB/DATA MINING/HIGH PERFORMANCE COMPUTING**
Chair: Dr. A. C. Admuthe Co-Chair: Dr. D. B. Kulkarni

2.30 pm to 2.50 pm Presentation - 06	09	Analysis of various Neural Network Techniques for handling multimodal Heterogeneous data	Arifa Shikalgar and Shefali Sonavane
2.50 pm to 3.10 pm Presentation - 07	17	On Applying Document Similarity Measures for Template based Clustering of Web Documents	Tanveer Bagban and Prakash Kulkarni
3.10 pm to 3.30 pm Presentation - 08	12	Image Annotation Methods: A Brief Survey	Sangita Nemade
3.30 pm to 3.50 pm Presentation - 09	02	An encrypted neural network learning to build safe trained model	Suhel Sayyad and Prof. Dr. D.B. Kulkarni
3.50 pm to 4.10 pm Presentation - 10	04	MPI performance guidelines for scalability	Karveer Manwadre and D.B. Kulkarni
4.10 pm to 4.25 pm	Tea Break Poster Presentation Chair: Dr. A C Admuthe Co-Chair: Dr. A.J. Umbarkar		
4.25 pm to 5.00 pm	Project Show case Chair: Dr A C Admuthe		

Day 2: Saturday, December 16, 2017

9.30 am to 10.00 am	Welcome Tea and breakfast		
10.00 am to 10.50 am	Keynote address 4: Dr R K Kamat SU Kolhapur		
10.50 am to 11.40 pm	Keynote Address 5: Dr Harish Kenchennawar GIT		
SESSION - 2 BIG DATA/MACHINE LEARNING/NETWORKS Chair : Dr. R. K. Kamat Co-Chair : Dr. S.V. Kulkarni			
	Paper ID	Paper	Author
11.40am to 12.00pm Presentation - 11	13	Navigator for Bus Passengers	Rohan Patil and Vikas Honmane
12.00 pm to 12.20 pm Presentation - 12	25	Review of Open-Source BCI approach using OpenViBE	Nilkanth Jadhav and Bashirahamad Momin
12.20 pm to 12.40 pm Presentation - 13	16	Exploiting Social Relations for Efficient Routing in Delay Tolerant Network Environment	Ajit Patil and Prakash Kulkarni
SESSION 2 (Parallel) (POST GRADUATE LABORATORY 1 CSE DEPARTMENT) Chair: Dr. Harish Kenchennawar Co-Chair: Dr. S. P. Sonavane			
11.40am to 12.00pm Presentation - 14	36	Outdoor Natural Scene Object Classification Using Probabilistic Neural Network	Chitali Laulkar and Prakash Kulkarni
12.00 pm to 12.20 pm Presentation - 15	15	Construction f Basis Matrices for (k,n) and Progressive Visual Cryptography Schemes.	Suhas Bhagate and Prakash Kulkarni
12.20 pm to 12.40 pm Presentation - 16	21	Contextualized System for Active-Learning Using Mobile Computing	Vikesh Tonpe and Prakash Kulkarni
12.40 pm to 1.20 pm	Poster presentation Chair : Dr. Meghshyam Prasad		
1.20 pm to 2.00 pm	Lunch break		
2.00 pm to 2.40 pm	Keynote Address – 6 Mr. Suhas Desai, Pune		
2.40 pm to 3.20pm	Keynote Address – 7 Ms. Minal Chougule, Mumbai		
3.20 pm to 3.30 pm	Tea Break		
3.30 pm to 4.30 pm	PANEL DISCUSSION <ul style="list-style-type: none"> • Dr R K Kamat • Dr Harish Kenchennawar • Dr. Meghshyam Prasad • Shri Suhas Desai, • Ms Minal Chougule 		
4.30 pm to 5 pm	Project Show Case Chair : Shri Suhas Desai Pune , Minal Chaugule		
5 pm to 5.30 pm	Valedictory		

Key Note Speech – 1

Recent Trends in Computer Networks

Dr. R. Venkateswaran, Senior Vice President, IoT Solutions,
Persistent Systems Limited, Pune



This talk provides a perspective on the advances and trends in the area of Computer Communication Networks. Using example and insights from the Internet architecture that has led to its phenomenal growth, the talk highlights some of the key design decisions made by the researchers over the past 40 years to address imminent challenges to the speed and scale of the Internet.

The Internet has continued to scale and grow at a phenomenal rate since the last 40 years. There have been specific milestones during these growth years that have fundamentally challenged the architectural decisions. Researchers have managed to find the right balance between technically superior and easy acceptability to overcome these challenges.

Using this historical context as the basis, the talk presents the challenges for addressing the newer challenges facing the Internet today. Covering diverse challenges including Routing, Multiprotocol support, Mobility, Advances in wireless technologies and Security, this talk focuses on the ways of overcoming some of these challenges.

The significant value of Software Defined Networks (SDN) and Network Function Virtualizations (NFV) is the key highlight of this talk. The talk also provides a simulated demonstration of some of the concepts - blending in the theoretical and implementation aspects of these technologies.

About Speaker: Dr. R. Venkateswaran

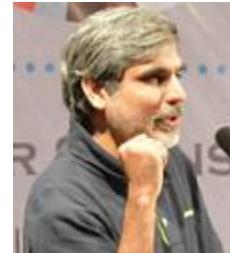
As the Senior Vice President of IoT Solutions at Persistent Systems, Dr.Venkateswaran (Venki) is responsible for the strategy and development of industry-specific transformation solutions leveraging IoT (Internet of Things) technologies. He joined Persistent Systems in 2002 and has undertaken various roles over the years, including that of SVP of Engineering for Persistent's Products Business, Chief Technology Officer, Head of Strategic Initiatives as well as Business Head for Telecom Business. Prior to Persistent, he worked for 7 years as a researcher at Bell Laboratories and also at the CTO office at Lucent Technologies.

He earned his B.Tech (1988) and M.Tech (1992) in Computer Science from IIT Bombay and has a PhD in Computer Science from Washington State University (1997). His PhD Research focus was on Multicast Routing Protocols. He holds multiple patents in the area of ATM Multicasting, and has authored numerous research papers that have been published in reputed journals and conferences. He has presented several technical talks in various educational institutions across India as part of the ACM India Eminent Speaker Program. He is recognized by the Savitribai Phule Pune University as a PhD Guide in the area of Computer Information and Technology.

Key Note Speech – 2

Going Beyond Patterns...

**Parag Kulkarni, CEO and Chief Scientist,
Iknowlation Research Labs Private Limited, Pune**
www.iknowlation.com



Patterns are haunting machine learning over years. We have been assimilating, classifying and associating patterns over years. Is it pattern based learning that is probably limiting our thought process and confined machine learning. In this talk let us take a fresh look to break pattern shackles and go beyond patterns, Human has ability to learn from uncertainties and learning from the events those did not take place at all. Can we take a look at these abilities to learn?

Can we learn for uncertainties? Reverse Hypothesis Machine Learning – tries to do exactly the same. There are many applications where we need to go beyond pattern-based paradigm. In this discourse let us take a closer look at these approaches and find more about new paradigm of Revers hypothesis machine learning...

About Speaker: Parag Kulkarni

Parag is an entrepreneur, Machine Learning researcher and author of best selling Innovation Strategy and Data science books. An avid reader, Parag is founding CEO and Chief Scientist of iknowlation Research Labs – a vibrant Machine Learning Product, research and Consulting Company. Parag has published over 300 research papers, invented over a dozen patents and he authored 15 books. Parag's machine learning ideas resulted in pioneering products those became commercially successful and produced unprecedented impact. As a consultant Parag has contributed to success of over two-dozen organizations including start-ups and established companies. He is pioneer of concepts Systemic MachineLearning, Context Vector Machines and Deep Explorative Machine Learning. He delivered over 300+ keynote addresses and 200+ tutorials across the globe.

An alumnus of WCE Sangli, Parag holds PhD from IIT, management education from IIM and was conferred higher doctorate DSc by UGSM monarch, Switzerland. His work on Systemic Machine Learning published by IEEE is widely cited. His areas of interest include Machine learning and allied areas with focus on optimal and systemic learning.

Key Note Speech – 3

Securing Internet of Things - Top 6 Risks and Mitigation Strategy

Suhas Desai, Vice President – Digital Security at Aujas



The number of smart devices is expected to jump 5 X from 5 Billion in 2015 to 25 Billion in 2020. Internet of Things is becoming a favorite target for cyber attackers, and it is a no-brainer to predict that it will only become worse. Gartner predicated that by 2020, more than 25% of identified attacks will involve more IOT devices.

More Smart Devices = More (Sensitive) Data = Higher Risk

In this session, focus is on 6 basic security concerns with Internet of Things that enterprises need to pay attention to, in order to enjoy the ride without falling off the roller coaster.

This session is to discuss on security initiatives in Industry 4.0 era, what are the current security trends, enterprise risk management strategies in Robots, AI, Chatbot's, telematics, connected cars & Industrial IOT and how IOT enthusiasts can apply these mitigation strategies & security best practices to secure devices, platforms & communication channels.

In this session, we will discuss case study on OpenHab – open Source IOT platform and its feasibility with connected home appliances. An IOT Enthusiast can apply the security principles for this integration and experience the power of connected world!

About Speaker: Suhas Desai

Suhas Desai is the Vice President of Digital Security Services at Aujas. Prior to Aujas, he was an Associate Director in the Cyber Security Advisory of PwC (PricewaterhouseCoopers). He started his career with Tech Mahindra.

He has delivered noted sessions at many global conferences and summits including RSA Singapore; INTEROP Mumbai; Communic Asia Singapore; OWASP Malaysia and ISACA, Dubai.

He was invited speaker at ‘Universiti Sains Malaysia’, Penang and ‘The Institute for Infocomm Research (I2R)’, Singapore. He has contributed technical features at ‘Linux Journal’ & ‘Linux For You’ magazines.

Key Note Speech – 4

Challenges in computing

Dr. Harish H. Kenchannavar, Professor, Department of Computer Science and Engineering, KLS Gogte Institute of Technology, Belagavi
harishhk@git.edu



In recent days, Wireless sensor networks have been deployed in many applications such as agriculture, water monitoring, medical applications, etc. Such applications are integrated with data collections, storing, computing and performances which need to be considered as research challenges. Wireless sensor network (WSN) and Internet of Things (IoT) are tiny devices which are resource constrained and connected to next level of cloud computing algorithms and technology where it should take less time and complexity. Computing mainly depends on data format, storage and processing efficient ways considering minimal resources such as energy, memory utilization, processing time and lifetime of deployed sensor devices. Hence, there is a need to devise efficient, less computing and simple algorithms which are used to improve the performance of the system. Challenges in devising algorithm may deal with deployment of nodes, routing, architectures and application model.

About Speaker: Dr. Harish H. Kenchannavar

Dr. Harish Kenchannavar finished his B.E from Basaveshwar Engineering College, Bagalkot in Computer Science and Engineering. He further pursued M.E in Computer Science and Engineering, Walchand College of Engineering, Sangli. He was awarded Ph.D degree in the year 2014 in the area of Quality of Service in WSN. His areas of interests are Wireless Sensor Network (WSN), Internet of Thing (IoT), Computer Networks, Simulation and Modeling to name a few. He is currently working in K.L.S.G.I.T College, Belagavi. He has published his works in various IEEE /Springer/ACM conferences and National and International Journals. He has conducted workshops on WSN and IOT for the faculty and PG students. He is a reviewer for many national and international journals and has chaired many international and national conference sessions. He is a professional member of IEEE, CSI and ISTE bodies.

An encrypted neural network learning to build safe trained model

S. S. Sayyad¹, D. B. Kulkarni²

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Abstract— Neural network learning is a technique that is used to solve problems of classification, prediction, clustering, modelling based on variety of data inputs in the form of structured, semi-structured and unstructured data. Learning accuracy is considered as key performance index in these neural network based learning algorithms. Many organizations that involves huge amount of data would want to outsource it to cloud for artificial intelligence based services. Various organizations who wish to train neural network model on their complex and huge data usually outsource the learning model on cloud. Outsourcing of learning model on cloud creates security concerns for input data and the learned model. In this paper, we propose a practical system that will train a neural network model that is encrypted during training process. The training is performed on the unencrypted data. The output of the system is a neural network model that possesses two properties. First, neural network model is protected from the malicious users, hence allows the users to train the model in insecure environments at no cost of risk. Second, the neural network model can make only encrypted predictions. We make use of homomorphic encryption techniques to fulfill the objectives and test our results on sentiment analysis dataset.

Keywords—Homomorphic encryption, neural network

Key References -

- [1] S. Chow, Y. He, and et al. Spice - simple privacy-preserving identity-management for cloud environment. In ACNS 2012, volume 7341 of Lecture Notes in Computer Science. Springer, 2012.
- [2] Jiawei Yuan, Shucheng Yu, Privacy Preserving Back-Propagation Neural Network Learning Made Practical with Cloud Computing. IEEE Transactions on Parallel and Distributed Systems, Vol. 25, No. 1, January 2014.
- [3] Mahmoud Barhamgi, Arosha K. Bandara, and Yijun Yu, Protecting Privacy in the Cloud: Current Practices, Future Directions, Computer IEEE Society February 2016.
- [4] Majid Bashir Malik, A model for Privacy Preserving in Data Mining using Soft Computing Techniques. March 2015 2, International Conference on Computing for Sustainable Global Development (INDIACoM).

- [5] Reza Shokri, Privacy-Preserving Deep Learning, 2015 53rd Annual Allerton Conference on Communication, Control, and Computing (Allerton) Oct 2015.
- [6] Nathan Dowlin, Ran Gilad-Bachrach, Kim Laine, Kristin Lauter, Michael Naehrig and John Wernsing, CryptoNets: Applying Neural Networks to Encrypted Data with High Throughput and Accuracy 29 December 2015.
- [7] Ryan Hayward, Chia-Chu Chiang, Parallelizing fully homomorphic encryption for a cloud environment. Journal of Applied Research and Technology 13 (2015) 245-252
- [8] Angel Yu, Wai Lok Lai, James Payor Efficient Integer Vector Homomorphic Encryption, May 2015.

MPI performance guidelines for scalability

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Abstract—MPI (Message Passing Interface) is most widely used parallel programming paradigm. It is used for application development on small as well as large high-performance computing systems. MPI standard provides a specification for different functions but it does not specify any performance guarantee for implementations. Nowadays, its various implementations from both vendors and research groups are available. Users are expecting consistent performance from all implementations and on all platforms. In literature, performance guidelines are defined for MPI communication, IO functions and derived data types. By using these guidelines as a base we have defined guidelines for scalability of MPI communication functions. Also, we have verified these guidelines by using benchmark application. We have conducted experiments on different MPI implementations such as MPICH, open MPI. The experimental results show that point to point communication functions are scalable. It is quite obvious as in point to point communication, the communication takes place pair of process. Hence these guidelines are defined as performance requirement by considering the semantics of these operations. All processes are involved in collective communication functions; therefore defining performance guidelines for collective communication is difficult. In this paper, we have defined the performance guidelines by considering the amount of data transferred in the function. Also, we have verified our defined guidelines and reasons for violations of these guidelines are elaborated.

Keywords— Performance guidelines for MPI functions, Scalability of MPI functions, High-performance computing

Key References -

- [9] A. Mallón, Guillermo L. Taboada, Carlos Teijeiro, Juan Touriño, Basilio B. Fraguela, Andrés Gómez, Ramón Doallo, J. Carlos Mouriño, “Performance Evaluation of MPI, UPC and OpenMP on Multicore Architectures”, EuroPVM/MPI 2009, LNCS 5759, pp. 174–184, 2009.
- [10] William D. Gropp, Rajeev Thakur, “Self-consistent MPI performance requirements”, In Recent Advances in Parallel Virtual Machine and Message Passing Interface. 14th European PVM/MPI

- Users' Group Meeting, volume 4757 of Lecture Notes in Computer Science, pages 36–45. Springer, 2007.
- [11] William D. Gropp, Dries Kimpe, Robert Ross, Rajeev Thakur and Jesper Larsson Traff, "Self-consistent MPI-IO performance requirements and expectations", EuroPVM/MPI 2008.
 - [12] William D. Gropp, Dries Kimpe, Robert Ross, Rajeev Thakur and Jesper Larsson Traff, "Performance Expectations and Guidelines for MPI Derived Datatypes", Recent Advances in the Message Passing Interface. EuroMPI 2011. Lecture Notes in Computer Science, vol 6960, 2011.
 - [13] Sascha Hunold, Alexandra Carpen-Amarie, Felix Donatus Lübbe, and Jesper Larsson Träff TU Wien, "PGMPI: Verifying Self-Consistent MPI Performance Guidelines", CoRR abs/1606.00215, 2016.
 - [14] Ralf Reussner, Peter Sanders, and Jesper Larsson Träff, "SKaMPI: A Comprehensive Benchmark for Public Benchmarking of MPI," Scientific Programming, vol. 10, no. 1, pp. 55-65, 2002. doi:10.1155/2002/202839
 - [15] <http://wce.ac.in/it/landing-page.php?id=9>.
 - [16] J. Liu, B. Chandrasekaran, W. Yu, J. Wu, D. Buntinas, S. Kini, P. Wyckoff, and D. K. Panda, "Micro-Benchmark Performance Comparison of High-Speed Cluster Interconnects" , IEEE Micro , Jan 2004. <http://mvapich.cse.ohio-state.edu/benchmarks/>
 - [17] Hunold, S., Carpen-Amarie, A., "Reproducible MPI benchmarking is still not as easy as you think", IEEE Transactions on Parallel and Distributed Systems , 2016.
 - [18] Subhash Saini, Robert Ciotti,Brian T. N. Gunney, Thomas E. Spelce, Alice Koniges, Don Dossa, Panagiotis Adamidis, Rolf Rabenseifner, Sunil R. Tiyyagura, Matthias Mueller, "Performance Evaluation of Supercomputers using HPCC and IMB Benchmarks", Journal of Computer and System Sciences, 2007

Handling of Class Imbalanced Problem in Big Data Sets: An Experimental Evaluation (UCPMOT)

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Abstract—The huge amount of NoSQL data has acknowledged a new provision of context for processing. A new trail of data handling technologies with massive resources assists to store and process these gigantic data sets. The current attention is to determine the undisclosed information by assimilating this data bulks & handling it as per use. Further they are pre-processed and converted for needful analysis. The volume and variety of these data sets endure rising relentlessly. Moreover, imbalanced in many real-worlds vast data sets have elevated a point of concern in the research domain. The skewed distribution of classes in the data sets poses a difficulty to learn using traditional classifiers. They tend more towards majority classes. In recent years, numerous solutions have been proposed to address imbalanced classification. However, they fail to address the various data characteristics such as overlapping, redundancy involving classification performance. A rational oversampling technique i.e. Updated Class Purity Maximization Oversampling Technique using Safe-Level based synthetic sample creation is proposed to efficiently handle imbalanced data sets. The newly suggested Lowest versus Highest method addresses the handling of multi-class data sets. The data sets from the UCI repository are processed using the map-reduce based programming on Hadoop framework. The evaluation parameters viz. F-measure and AUC are used to authenticate the performance of proposed technique over benchmarking techniques. The results attained evidently quote the dominance of the proposed technique.

Keywords— Imbalanced datasets, Big Data, Over-sampling techniques, Multi-class, Safe-Level based Synthetic Samples

Key References -

- [1] X. Wu et al., “Data mining with big data”, IEEE Transaction on Knowledge and Data Engineering, Vol.26, Issue.1, pp.97–107, 2014.
- [2] A. Gandomi, M. Haider, “Beyond the hype: Big data concepts, methods, and analytics” International Journal of Information Management, Vol.35, Issue.2, pp.137–144, 2015.
- [3] D. Agrawal et al., “Challenges and Opportunity with Big Data”, Community White Paper, pp.01-16, 2012.

- [4] W. Zhao, H. Ma, Q. He., "Parallel k-means clustering based on mapreduce", CloudCom, pp.674-679, 2009.
- [5] X.-W. Chen et al., "Big data deep learning: Challenges and perspectives", IEEE Access Practical Innovations: open solutions, Vol.2, pp.514 -525, 2014.
- [6] "Big Data: Challenges and Opportunities, Infosys Labs Briefings - Infosys Labs," <http://www.infosys.com/infosys-labs/publications/Documents/bigdata-challenges-opportunities.pdf>.
- [7] N. Japkowicz, S. Stephen, "The class imbalance problem: a systematic study", ACM Intelligent Data Analysis Journal, Vol.6, Issue.5, pp.429–449, 2002.
- [8] H. He, E. Garcia, "Learning from Imbalanced Data", IEEE Transaction on Knowledge and Data Engineering, Vol.21, Issue.9, pp.1263–1284, 2009.
- [9] Y. Sun, A. Wong, M. Kamel, "CLASSIFICATION OF IMBALANCED DATA: A REVIEW", International Journal of Pattern Recognition Artificial Intelligence, Vol.23, Issue.4, pp.687–719, 2009.
- [10] P. Byoung-Jun, S. Oh, W. Pedrycz, "The design of polynomial function-based neural network predictors for detection of software defects", Elsevier: Journal of Information Sciences, pp.40-57, 2013.
- [11] V. López et al., "An insight into classification with imbalanced data: empirical results and current trends on using data intrinsic characteristics", Elsevier: Journal of Information Sciences, Vol.250, pp.113–141, 2013.
- [12] M. A. Nadaf, S. S. Patil, "Performance Evaluation of Categorizing Technical Support Requests Using Advanced K-Means Algorithm", IEEE International Advance Computing Conference, pp.409-414, 2015.
- [13] R. C. Bhagat, S. S. Patil, "Enhanced SMOTE algorithm for classification of imbalanced bigdata using Random Forest", IEEE International Advance Computing Conference, pp.403-408, 2015.
- [14] R. Sara, V. Lopez, J. Benitez, F. Herrera, "On the use of MapReduce for imbalanced big data using Random Forest", Elsevier: Journal of Information Sciences, pp.112-137, 2014.
- [15] H. Jiang, Y. Chen, Z. Qiao, "Scaling up MapReduce-based Big Data Processing on Multi-GPU systems", SpringerLink Cluster Computing, Vol.18, Issue. 1, pp.369–383, 2015.
- [16] G. Batista, R. Prati, M. Monard, "A study of the behaviour of several methods for balancing machine learning training data", ACM SIGKDD Explorations Newsletter - Special issue on learning from imbalanced datasets, Vol.6, Issue. 1, pp.20–29, 2004.
- [17] N. Chawla, K. W. Bowyer, L. O. Hall, W. P. Kegelmeyer, "SMOTE: Synthetic minority over-sampling technique", Journal of Artificial Intelligence Research, Vol.16, pp.321- 357, 2002.
- [18] H. Han, W. Wang, B. Mao, "Borderline-SMOTE: a new over-sampling method in imbalanced data sets learning", Proceedings of the 2005 International Conference on Intelligent Computing, Vol.3644 of Lecture Notes in Computer Science, pp.878–887, 2005.
- [19] B. Chumphol, K. Sinapiromsaran, C. Lursinsap, "Safe-level-smote: Safelevel- synthetic minority over-sampling technique for handling the class imbalanced problem", AKDD Springer Berlin Heidelberg, pp.475-482, 2009.
- [20] H. He et al., "ADASYN: Adaptive Synthetic Sampling Approach for Imbalanced Learning", IEEE International Joint Conference on Neural Networks, pp. 1322-1328, 2008.
- [21] S. Garcia et al., "Evolutionary-based selection of generalized instances for imbalanced classification", Elsevier: Journal of Knowledge-Based Systems, pp.3-12, 2012.

- [22] H. Feng, L. Hang, "A Novel Boundary Oversampling Algorithm Based on Neighborhood Rough Set Model: NRS Boundary-SMOTE", Hindawi: Mathematical Problems in Engineering, 2013.
- [23] N. Chawla, L. Aleksandar, L. Hall, K. Bowyer, "SMOTEBoost: Improving prediction of the minority class in boosting", PKDD Springer Berlin Heidelberg, pp.107-119, 2003.
- [24] H. Xiong, Y. Yang, S. Zhao, "Local clustering ensemble learning method based on improved AdaBoost for rare class analysis", Journal of Computational Information Systems, Vol.8, Issue.4, pp.1783-1790, 2012.
- [25] F. Alberto, M. Jesus, F. Herrera, "Multi-class imbalanced data-sets with linguistic fuzzy rule based classification systems based on pairwise learning", Springer IPMU, pp.89–98, 2010.
- [26] J. Hanl, Y. Liul, X. Sunl, "A Scalable Random Forest Algorithm Based on MapReduce", IEEE, pp.849-852, 2013.
- [27] J. Kwak, T. Lee, C. Kim, "An Incremental Clustering-Based Fault Detection Algorithm for Class-Imbalanced Process Data", IEEE Transactions on Semiconductor Manufacturing, Vol.28, Issue.3, pp.318-328, 2015.
- [28] S. Kim, H. Kim, Y. Namkoong, "Ordinal Classification of Imbalanced Data with Application in Emergency and Disaster Information Services", IEEE Intelligent Systems, Vol.31, Issue.5, pp.50-56, 2016.
- [29] M. Chandak, "Role of big-data in classification and novel class detection in data streams", Springer Journal of Big Data, pp.1-9, 2016.
- [30] S. Patil, S. Sonavane, "Enhanced Over Sampling Techniques for Imbalanced Big Data Set Classification", Data Science and Big Data: An Environment of Computational Intelligence: Studies in Big Data, Springer International Publishing AG, Vol.24, pp.49-81, 2017.
- [31] W. A. Rivera, O. Asparouhov, "Safe Level OUPS for Improving Target Concept Learning in Imbalanced Data Sets", Proceedings of the IEEE Southeast Conference, pp.1-8, 2015.
- [32] S. Yen, Y. Lee, "Under-Sampling Approaches for Improving Prediction of the Minority Class in an Imbalanced Dataset", ICIC 2006, LNCIS 344, pp.731 – 740, 2006.
- [33] C. Bunkhumpornpat, K. Sinapiromsaran, C. Lursinsap, "DBSMOTE: Density-Based Synthetic Minority Over-sampling TEchnique", Springer Journal of Applied Intelligence, pp.664-684, 2012.
- [34] H. Guo et al., "Learning from class-imbalanced data: Review of methods and applications", Elsevier Expert Systems With Applications, Vol.73, pp.220 – 239, 2017.
- [35] Z. Zhang et al., "Empowering one-vs-one decomposition with ensemble learning for multi-class imbalanced data", Elsevier Knowledge-Based Systems, Vol.106, pp.251 – 263, 2016.
- [36] A. Vorobeva, "Examining the Performance of Classification Algorithms for Imbalanced Data Sets in Web Author Identification" Proceeding of the 18th Conference of FRUCT-ISPIR Association, pp.385 – 390, 2016.
- [37] Machine Learning Repository, Center for Machine Learning and Intelligent Systems, US (NFS). <https://archive.ics.uci.edu/ml/datasets.html>
- [38] K. Yoon, S. Kwek, "An Unsupervised Learning Approach to Resolving the Data Imbalanced Issue in Supervised Learning Problems in Functional Genomics", IEEE: International Conference on Hybrid Intelligent Systems, pp.1-6, 2005.
- [39] M. Bach et al., "The study of under- and over-sampling methods' utility in analysis of highly imbalanced data on osteoporosis", Elsevier Journal of Information Sciences, Vol.384, pp.174–190, 2017.

- [40] D. Li et al., "Using mega-trend-diffusion and artificial samples in small data set learning for early flexible manufacturing system scheduling knowledge", Elsevier: Journal of Computation and Operational Research, Vol.34, pp.966–982, 2007.
- [41] S. Barua et al., "MWMOTE—Majority Weighted Minority Oversampling Technique for Imbalanced Data Set Learning", IEEE: Transaction on Knowledge and Data Engineering, Vol.26, pp.405–425, 2014.
- [42] X. Ai et al., "Immune Centroids Over-Sampling Method for Multi-class Classification", T. Cao, E. Lim, Z. Zhou., T. Ho, D. Cheung, H. Motoda, Advances in Knowledge Discovery and Data Mining (eds), PAKDD 2015, Springer, Vol.9077, pp.251–263, 2015.

Analysis of Software Requirements for an M-Learning Framework

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Abstract—In this paper, we propose a software framework for an m-learning environment. Here, we attempt the software requirement analysis for a software tool to be developed for m-learning. As the definition goes ‘m-learning is learning while move’. Our aim is to use android supportive smart devices on which this m-learning software will execute.

Developing software for m-learning application is a complex process which requires judicious handling of prioritization, specification, delivering and finally application development. In this paper we try to establish four major and vital requirements such as human-smart device interaction, infrastructure of mobile-computing, packaging and presenting of the learning content, instructional and learning design. Much m-learning software may fail to meet the objective because of non-appropriate handling of above mentioned requirements. These requirements are mutually supporting and affecting each other. For example, limited screen size and Internet connectivity limit the size of learning content and user interface. Hence these kinds of requirements are very important to consider during software development of m-learning. Our framework would constitute of smart mobile devices, interacting with cloud using mobile software agents. We are proposing the use of mobile agents for communication between smart devices and cloud.

Key References -

- [1] Sudhindra B.D. and Srinivas .R.M, “Context-Aware Personalized M-Learning Application Using Multi Agents” International Journal of Computer Theory and Applications, ISSN-0974-5572, pp. 459-465, 2017.
- [2] M.Sarrab, A. Alzahrani, N. Alalwan and O.Alfarraj, “From traditional learning into mobile learning in education at the university level: under graduate student perspective”, International Journal of mobile learning and Organization, vol. 8, pp. 167-186, 2014.
- [3] A.G.Saavedra, P. Serrano, “ Device-to-Device communications with WiFi Direct: overview and experimentation”, IEEE Wireless Communications, vol 20(3) 2013.

- [4] Mohammed A., Tanweer A. " Design an M-Learning Framework for Smart Learning in Ad Hoc Network of Android Devices", IEEE International Conference on Computational Intelligence and Computing Research, 2015.
- [5] N.Charness, P.Holley, J.Feddon in, T.Jastrzembski, "Light pen use and practice minimize age and hand performance differences in pointing tasks" Human Factros , p. 373-384,2004.
- [6] A.Collins McLaughlin, W.A. Rogers in A.D.Fisk, " Using Direct and Indirect Input Devices : Attention Demands " ACM Trans Compute Human Interact, p.1-15, April 2009.
- [7] B.Shneiderman, Designing the User Interface : Strategies for Effective Human-Computer - Interaction , Menlo Park : Addison Wesley Longman,1998.
- [8] G. Schwabe and C.Goth, "Mobile learning with a mobile gamedesign and motivational effects", Journal of Computer Assisted Learning , vol21, pp. 195-206,2010.
- [9] C.Looi, D.Sun and W.Xie, " Exploring Students' Progression in an Inquiry Science Curriculum Enabled by Mobile learning " , Learning Technologies , IEEE Transactions on vol. 8, pp 43-54,2015.
- [10] X.Yang, X.Li and T.Lu " Using mobile phones in collegeclassroom settings : Effects of presentation mode and interest on concentration and achievement" , Computers &Education, vol.88, pp 292 – 302,2015.
- [11] J. Lowenthal , " Using mobile learning : Determinates impacting behavioural intention",TheAmer.Jrnl of Distance Education, vol.24, pp.195-206,2010.
- [12] X.Gu, F.Gu and J.Laffey , " Designing a mobile system for lifelong learning on the move", Journal of Computer Assisted Learning , vol.27, pp. 204-215,2011

Improved Genetic Particle Swarm Optimization and Feature Subset Selection for Extreme Learning Machine

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Abstract—Particle Swarm Optimization (PSO) is a heuristic global optimization method, which is most commonly used for feature subset selection problem. However, PSO requires the fixed number of optimal features as an input. It is a very critical task to analyze initially that how many features are relevant and non-redundant present in the given dataset. To solve the said problem this paper has proposed Improved Genetic – PSO (IG-PSO) algorithm for Extreme Learning Machine (ELM) which returns optimal features as well as an optimal number of features. The IG-PSO algorithm is experimented on six benchmarked dataset for handling medical dataset classification which improves the classification accuracy by using optimal features. Also, the simulation results demonstrate that IG-PSO algorithm has the capability to handle optimization, dimensionality reduction and supervised binary classification problems. The effectiveness of this algorithm is verified by using statistical tests.

Keywords—Feature Subset Selection Problem, Particle Swarm Optimization, Extreme Learning Machine, Classification Problem

Key References -

- [1] L. Yu and H. Liu, "Efficient feature selection via analysis of relevance and redundancy", Journal of machine learning research, pp. 1205-1224, 2014.
- [2] Kittler,J. and aan den Rijn, Netherlands, "Feature Set Search Algorithms", , Pattern Recognition and Signal Processing, Chapter pp. 41-60, 1978.
- [3] D. Koller and M. Sahami, "Toward optimal feature selection", Tech.rep. Stanford InfoLab, 1996.
- [4] Zhi-Hui Zhan, Jun Zhang, Yun Li and Henry Shu-Hung Chung, " Adaptive Particle Swarm Optimization", IEEE Trans. On Systems, Man, and Cybernetics- Part B, vol. 39,no. 6, December 2009.
- [5] Iftikhar Ahmad, "Feature Selection Using Particle Swarm Optimization in Intrusion Detection", International Journal of Distributed Sensor Network, January 2015.
- [6] G.B. Huang, Q.-Y. Zhu and C.K. Siew, "Extreme learning machine: a new learning scheme of feedforward neural networks", In proceedings. IEEE International Joint Conference, vol. 2, pp. 985-990, 2004.

- [7] G.-B. Huang, Q.-Y. Zhu and C. K. Siew, "Extreme learning machine: theory and applications", *Neurocomputing* 70 (1), pp. 489501, 2006.
- [8] G.-B. Huang, L. Chen, and C.-K. Siew, "Universal approximation using incremental constructive feedforward networks with random hidden node", *IEEE Transactions on Neural Network*, vol. 17., no. 4., pp. 879-892, 2006.
- [9] G.-B. Huang, H. Zhou, X. Ding and R. Zhang, "Extreme learning machine for regression and multiclass classification", *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)* 42 (2), pp. 513-529, 2012.
- [10] G.-B. Huang, "An insight into extreme learning machines: Randomneurons, random features and kernels", *Cognit. Computat*, vol. 6., no.3., pp. 376-390, 2014.
- [11] R. Eberhart and J. Kennedy, "New optimizer using particle swarm theory," In Proceedings International Symposium on Micro Machine and Human Science, pp. 39–43, October1995.
- [12] B. Xue, M. Zhang, and W. N. Browne, "Particle swarm optimization for feature selection in classification: amulti-objective approach," *IEEE Transactions on Cybernetics*, vol. 43, no. 6, pp.1656–1671, 2013.
- [13] B. Xue, M. Zhang, and W. N. Browne, "Particle swarm optimisation for feature selection in classification: novel initialisation and updating mechanisms", *Applied Soft Computing Journal*,vol. 18, pp. 261–276, 2014.
- [14] M. Lichman, UCI machine learning repository. URL`http://archive.ics.uci.edu/ml`, 2013. UCI repository
- [15] Akusok, A., Björk, K.-M., Miche, Y., Lendasse, A., "High-performance extreme learning machines: a complete toolbox for big data applications". *IEEE Access* 3, pp.1011–1025, 2015.
- [16] G. Karakaya, S. Galelli, S. D. Ahipa sao glu and R. Taormina, "Identifying (quasi) equally informative subsets in feature selection problems for classification: a max-relevance min-redundancy approach",*IEEE transactions on cybernetics* 46 (6), pp. 1424-1437,2016.
- [17] Nahato, K. B., Nehemiah, K. H., Kannan, A, "Hybrid approach using fuzzy sets and extreme learning machine for classifying clinical datasets", *Elsevier Journal of Informatics in Medicine Unlocked* 2, 1–11, 2016.
- [18] Han, J., Pei, J., Kamber, M., 2011. Data mining: concepts and techniques. Elsevier.
- [19] Mahdiyah, U., Irawan, M. I., Imah, E. M., "Integrating data selection and extreme learning machine for imbalanced data". *Procedia Computer Science* 59, 221–229, 2015.
- [20] Parikh, R., Mathai, A., Parikh, S., Sekhar, G. C., Thomas, R., Understanding and using sensitivity, specificity and predictive values. *Indian journal of ophthalmology* 56 (1), 45, 2008.
- [21] Archana Kale and Shefali Sonavane, "Optimal Feature Subset Selection for Fuzzy Extreme Learning Machine using Genetic Algorithm with Multilevel Parameter Optimization", *IEEE International conference on Signal and Image Processing Applications* pp.445-450, Septmber 2017.
- [22] A. Kale and S. Sonavane, "Hybrid Feature Subset Selection Approach for Fuzzy-Extreme Learning Machine", *Springer journal of Computational Intelligence and Complexity - Data Enabled and Discovery Applications*, September 2017.
- [23] D. C. alis,ir, E. Doğantekin, "An automatic diabetes diagnosis system based on LDA-wavelet support vector machine classifier", *ExpertSyst. Appl.* 38(7), 8311–8315, 2011.
- [24] H. Temurtas, N. Yumusak, F. Temurtas, "A comparative study on diabetes disease diagnosis using neural networks". *Expert Syst.Appl.* 36(4), 8610–8615, 2009.

- [25] C.V. Subbulakshmi, S.N. Deepa, "Medical dataset classification: a machine learning paradigm integrating particle swarm optimization with extreme learning machine classifier", *Scientific World Journal* 2015.
- [26] F.J. Martínez-Estudillo, C. Hervás-Martínez, P.A. Gutiérrez, A.C. Martínez-Estudillo, "Evolutionary product-unit neural networks classifier"s. *Neurocomputing* 72(1), 548–561, 2008.
- [27] C. Hervás-Martínez, F.J. Martínez-Estudillo, M. Carbonero-Ruz, "Multilogistic regression by means of evolutionary product-unit neural networks". *Neural Netw.* 21(7), 951–961, 2008.

Analysis of various Neural Network Techniques for handling multimodal Heterogeneous data

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Abstract— The process of considering two or more different forms of input parameters and performing various processes in it to retrieve the relevant information is known as multiple heterogeneity. By doing so, the dimensionality of the data will be reduced and hence the processing time can be reduced. To attain this, several processes have to be encompassed in the proposed research approach. The goal of this research is to compare various deep learning techniques such as Artificial Neural Network (ANN), Deep Neural Network (DNN), and Convolutional Neural Network (CNN) for handling multimodal heterogeneous data. The major issue in CNN is the variation of weight factor. In this current research, the weight factor of DNN is integrated with CNN and the optimization method, Particle Swarm Optimization (PSO) is deployed in order to improve the efficiency of the learning technique. Dicom image and the EEG signal are considered as heterogeneous data for experimentation. The experimentation is carried out using MATLAB/SIMULINK tool and the performance metrics are evaluated.

Keywords— Deep learning techniques, Dicom image, EEG signal, multiple heterogeneity

Key References -

- [1] Michalakidis, G. , “ Appreciation of structured and unstructured content to aid decision making-from Web scraping to ontologies and data dictionaries in healthcare ” (Doctoral dissertation, University of Surrey (United Kingdom)), 2016.
- [2] Chen, C. P., & Zhang, C. Y., “ Data-intensive applications, challenges, techniques and technologies: A survey on Big Data”, Elsevier,Information Sciences, 275, 314-347, 2014.
- [3] Bordes, A., Glorot, X., Weston, J., & Bengio, Y. , “A semantic matching energy function for learning with multi-relational data.” , Machine Learning, 94(2), 233-259, 2014
- [4] Johnson, A. E., Ghassemi, M. M., Nemati, S., Niehaus, K. E., Clifton, D. A., & Clifford, G. D., “ Machine learning and decision support in critical care”, Proceedings of the IEEE, 104(2), 444-466, 2016.
- [5] Egorov, A., “Distributed Stream Processing with the Intention of Mining”, 2017.
- [6] Längkvist, M., Karlsson, L., & Loutfi, A., “A review of unsupervised feature learning and deep learning for time-series modeling”, Pattern Recognition Letters, 42, 11-24, 2014.

- [8] Huang, F., Ahuja, A., Downey, D., Yang, Y., Guo, Y., & Yates, A., " Learning representations for weakly supervised natural language processing tasks", Computational Linguistics, 40(1), 85-120, 2014.
- [9] Shen, D., Wu, G., & Suk, H. I. , " Deep learning in medical image analysis", Annual Review of Biomedical Engineering, (0), 2017.
- [10] Zerdoumi, S., Sabri, A. Q. M., Kamsin, A., Hashem, I. A. T., Gani, A., Hakak, S., ... & Chang, V. , "Image pattern recognition in big data: taxonomy and open challenges: survey", Multimedia Tools and Applications, 1-31, 2017.
- [11] Wu, D., Pigou, L., Kindermans, P. J., Le, N. D. H., Shao, L., Dambre, J., & Odobez, J. M. , "Deep dynamic neural networks for multimodal gesture segmentation and recognition", IEEE transactions on pattern analysis and machine intelligence, 38(8), 1583-1597, 2016.
- [12] Kan, M., Shan, S., Zhang, H., Lao, S., & Chen, X. , "Multi-view discriminant analysis", IEEE transactions on pattern analysis and machine intelligence, 38(1), 188-194, 2016.
- [13] Yu, J., Yang, X., Gao, F., & Tao, D. , "Deep multimodal distance metric learning using click constraints for image ranking", IEEE transactions on cybernetics, 2016.
- [14] Varol, E., Sotiras, A., Davatzikos, C., "HYDRA: Revealing heterogeneity of imaging and genetic patterns through a multiple max-margin discriminative analysis framework.", Alzheimer's Disease Neuroimaging Initiative, NeuroImage, 145, 346-364, 2017.
- [15] Chen, Y., Lin, Z., Zhao, X., Wang, G., &Gu, Y., "Deep learning-based classification of hyperspectral data", IEEE Journal of Selected topics in applied earth observations and remote sensing, 7(6), 2094-2107, 2014.
- [16] Alsheikh, M. A., Niyato, D., Lin, S., Tan, H. P., & Han, Z., "Mobile big data analytics using deep learning and apache spark", IEEE network, 30(3), 22-29, 2016.
- [17] Fan, C., Xiao, F., & Zhao, Y. , "A short-term building cooling load prediction method using deep learning algorithms", Applied Energy, 195, 222-233, 2017.
- [18] Elhossini, A., Areibi, S.,& Dony, R. , "Strength Pareto particle swarm optimization and hybrid EA-PSO for multi-objective optimization", Evolutionary Computation, 18(1), 127-156, 2010.
- [19] Siqi Liu, Sidong Liu, Dagan Feng, Weidong Cai, Member, "Multimodal Neuroimaging Feature Learning for Multiclass Diagnosis of Alzheimer's Disease ", IEEE Transactions On Biomedical Engineering, Vol. 62, No. 4, April 2015.
- [20] M. Fatourechi, A. Bashashati, R. K. Ward, G. E. Birch. EMG and EOG artifacts in brain computer interface systems: a survey. Clinical Neurophysiology, 118, 480–494, 2007.

Image Annotation Methods: A Brief Survey

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Abstract: Automatic image annotation is providing smart service to the users of photo-sharing site. The image annotation methods fall in various categories such as image segmentation, feature extraction and machine learning. Image annotation efficiency and scalability are most important objectives while designing any image annotation technique. Recently, automatic sentence generation to describe each image increases the interest of researchers. The primary problem of current techniques of automatic image annotation (AIA) are low scalability and effectiveness performance using large datasets. Additionally, AIA is a promising approach to achieve the efficient image classification, retrieval and management. By considering different objectives such as image classification, image description and image retrieval along with image annotation, there is some scope of improvement in the existing methods. This paper presents the brief survey of recent image annotation methods based on image segmentation, feature extraction and classifiers. The analysis is presented in comparative form with respect to different parameters of recent techniques.

Keywords— Image Annotation, Image Classification, Image Retrieval, Machine Learning, Feature Extraction.

Key References -

- [1] P. Duygulu, K. Barnard, J. F. G. de Freitas, and D. A. Forsyth," Object recognition as machine translation: Learning a lexicon for a fixed image vocabulary", In ECCV, pages 97–112, 2002.
- [2] S. L. Feng, R. Manmatha, and V. Lavrenko," Multiple Bernoulli relevance models for image and video annotation", In Proc.CVPR, pages 1002–1009, 2004.
- [3] A. Gupta and L. Davis," Beyond nouns: Exploiting prepositions and comparative adjectives for learning visual classifiers", In ECCV, France, pp. 16-29, 2008.
- [4] S. Maji, A. Berg, and J. Malik, "Classification using intersection kernel support vector machines is efficient", In Proc. Computer. Vis. Pattern Recognit., pp. 1–8, 2008.
- [5] Anna Bosch, Andrew Zisserman, and Xavier Muñoz," Scene classification via pLSA", In Proceedings of the 9th European conference on Computer Vision - Volume Part IV (ECCV'06), Aleš Leonardis, Horst Bischof, and Axel Pinz (Eds.), Vol. Part IV. Springer-Verlag, Berlin, Heidelberg, pp.517-530, 2006.
- [6] J. Yang, K. Yu, and T. Huang, "Efficient highly over-complete sparse coding using a mixture model", In Proceedings of the 11th European conference on Computer vision: Part V

- (ECCV'10), Kostas Daniilidis, Petros Maragos, and Nikos Paragios (Eds.). Springer-Verlag, Berlin, Heidelberg, 113-126,2010.
- [7] Zhiwu Lu and Horace H. S. Ip, "Spatial Markov Kernels for Image Categorization and Annotation", IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics), vol. 41, no. 4, pp. 976-989, Aug. 2011.
 - [8] Liping Jing, Chao Zhang, and Michael K. Ng, "SNMFCA: Supervised NMF-Based Image Classification and Annotation", IEEE Transactions on image processing, vol. 21, no. 11,pp. 4508-4521, 2012.
 - [9] Zenghai Chen, Hong Fu, Zheru Chi and David Dagan Feng, "An Adaptive Recognition Model for Image Annotation", IEEE Transactions on Systems, Man, and Cybernetics, vol. 42, no. 6, pp. 1120-1127, 2012.
 - [10] Yun Gu, Xueming Qian, Qing Li, Meng Wang, Richang Hong, and Qi Tian, "Image Annotation by Latent Community Detection and Multikernel Learning", IEEE Transactions on Image Processing, vol. 24, no. 11, pp. 3450-3463, 2015.
 - [11] Xiaochun Cao, Hua Zhang, XiaojieGuo, Si Liu, and Dan Meng, "SLED: Semantic Label Embedding Dictionary Representation for Multilabel Image Annotation", IEEE Transactions on Image Processing, vol. 24, no. 9, pp. 2746-2759, 2015.
 - [12] Fei Wu, Zhuhao Wang, Zhongfei Zhang, Yi Yang, Jiebo Luo, Wenwu Zhu, and Yueting Zhuang, "Weakly Semi-Supervised Deep Learning for Multi-Label Image Annotation", IEEE Transactions on big data, vol. 1, no. 3, pp. 109-122, 2015.
 - [13] L. Feng and B. Bhanu, "Semantic Concept Co-Occurrence Patterns for Image Annotation and Retrieval", IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 38, no. 4, pp. 785-799, 2016.
 - [14] X. Y. Jing, F. Wu, Z. Li, R. Hu and D. Zhang, "Multi-Label Dictionary Learning for Image Annotation", IEEE Transactions on Image Processing, vol. 25, no. 6, pp. 2712-2725, 2016.
 - [15] A. Tariq and H. Foroosh, "A Context-Driven Extractive Framework for Generating Realistic Image Descriptions," in IEEE Transactions on Image Processing, vol. 26, no. 2, pp. 619-632, 2017.
 - [16] Mingyuan Jiu, and Hichem Sahbi, "Nonlinear Deep Kernel Learning for Image Annotation", IEEE Transactions on image processing, vol. 26, no. 4, pp. 1820-1832, 2017.
 - [17] Z. Shi, Y. Yang, T. M. Hospedales and T. Xiang, "Weakly-Supervised Image Annotation and Segmentation with Objects and Attributes", IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 39, no. 12, pp. 2525-2538, 2017.
 - [18] R. Hong, M. Wang, Y. Gao, D. Tao, X. Li and X. Wu, "Image Annotation by Multiple-Instance Learning With Discriminative Feature Mapping and Selection", IEEE Transactions on Cybernetics, vol. 44, no. 5, pp. 669-680, 2014.
 - [19] X. Ding, B. Li, W. Xiong, W. Guo, W. Hu and B. Wang, "Multi-Instance Multi-Label Learning Combining Hierarchical Context and its Application to Image Annotation", IEEE Transactions on Multimedia, vol. 18, no. 8, pp. 1616-1627, 2016.
 - [20] J. Song, L. Gao, F. Nie, H. T. Shen, Y. Yan and N. Sebe, "Optimized Graph Learning Using Partial Tags and Multiple Features for Image and Video Annotation", IEEE Transactions on Image Processing, vol. 25, no. 11, pp. 4999-5011, 2016.
 - [21] J. Wang, Y. Yang, J. Mao, Z. Huang, C. Huang and W. Xu, "CNN-RNN: A Unified Framework for Multi-label Image Classification", IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Las Vegas, NV, pp. 2285-2294, 2016.

- [22] R. Wang, Y. Xie, J. Yang, L. Xue, M. Hu, Q. Zhang, "Large scale automatic image annotation based on convolution neural network", Journal of Visual Communication and Image Representation, Volume 49, Pages 213-224, 2017.

Navigator for Bus Passengers

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Abstract: Transportation is very important in today's world. People depend on public transportation to move from place to place. Buses contribute a major part in public transportation. But often the bus journey is inconvenient and people avoid buses due to their unpredictable arrival time and over-crowdedness. In this paper, we propose a system which can make the bus journey convenient and enjoyable. The system we propose is called Navigator for Bus passengers. This system provides arrival time, crowd information and many other features directly to the user's smart phone.

Keywords— — Smart ticketing machine, smart bus journey, Internet of Things (IoT), smart city, bus transportation.

Key References -

- [1] Marcus Handte, Stefan Foell, Stephan Wagner, Gerd Kortuem, and Pedro José Marrón, "An Internet-of-Things Enabled Connected Navigation System for Urban Bus Riders", IEEE INTERNET OF THINGS JOURNAL, VOL. 3, NO. 5, OCTOBER 2016.
- [2] M. Handte et al., "Crowd density estimation for public transport vehicles", in Proc. Workshop Min. Urban Data (MUD) Joint Conf. EDBT/ICDT, Athens, Greece, Mar. 2014, pp. 315–322.
- [3] A. Thiagarajan, J. Biagioni, T. Gerlich, and J. Eriksson, "Cooperative transit tracking using smartphones", in Proc. 8th ACM Conf. Embedded Netw. Sensor Syst., Zürich, Switzerland, 2010, pp. 85–98.
- [4] B. Ferris, K. Watkins, and A. Borning, "OneBusAway: A transit traveller information system", Mobile Computing, Applications, and Services. Heidelberg, Germany: Springer, 2010, pp. 92–106.
- [5] P. Zhou, Y. Zheng, and M. Li, "How long to wait? Predicting bus arrival time with mobile phone based participatory sensing", IEEE Trans. Mobile Comput., vol. 13, no. 6, pp. 1228–1241, Jun. 2014.
- [6] L. Zhang, S. D. Gupta, J.-Q. Li, K. Zhou, and W. B. Zhang, "Path2Go: Context-aware services for mobile real-time
- [7] Mrityunjaya D H, Naveen Kumar, Laxmikant, Sameer Ali, H. M. Kelagadi, "Smart Transportation", International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC 2017).

- [8] Sumit N Shukla, Tushar A Champaneria, "Survey of Various Data Collection Ways for Smart Transportation Domain of Smart City", International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC 2017).
- [9] Thunyasit Pholprasit, Suporn Pongnumkul, Chalermpol Saiprasert, Sarinthon Mangkorn-ngam and Lalida Jaritsup, "LiveBusTrack : High-frequency Location Update Information System for Shuttle/Bus Riders", 2013 13th International Symposium on Communications and Information Technologies (ISCIT).

Construction of Basis Matrices for (k, n) and Progressive Visual Cryptography Schemes

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Abstract: Security of digital information plays important role to keep the integrity of original media. A secret is something which is kept away from the knowledge of any but those who are privileged to access it. Secret sharing scheme provides a mechanism for sharing secrets among different users securely, where each user receives his part of encoded secret information called as a share. Sufficient number of shares need to be combined together to reconstruct secret information. Text, images, audio and video can be used for sharing secret information in secret sharing scheme. Secret sharing scheme in which secret information is encoded in form of concealed images is called as Visual Cryptography. There are various Visual Cryptography Schemes. Visual Cryptography Scheme's functionality is dependent on their basis matrices. Constructions of basis matrices for various OR-based and XOR-based Visual Cryptography Schemes are elaborated in this paper.

Keywords— Secret sharing scheme, Visual Cryptography, Data hiding

Key References -

- [1] Shamir, A. 1979. How to Share a Secret. Communications of the ACM. 22: 612-613.
- [2] Blakely, G. R. 1979. Safeguarding Cryptographic Keys. Proceedings of the National Computer Conference, American Federation of Information Processing Societies Proceedings. 48: 313-317.
- [3] Moni Naor and Adi Shamir, "Visual cryptography". In Proceedings of Advances in Cryptology, EUROCRYPT 94, Lecture Notes in Computer Science, 1995, (950):pp. 1-12.
- [4] S. J. Shyu, S. Y. Huang, Y. K. Lee, R. Z. Wang, and K. Chen, "Sharing multiple secrets in visual cryptography", Pattern Recognition, Vol. 40, Issue 12, pp. 3633 - 3651, 2007.
- [5] Nakajima, M. and Yamaguchi, Y., "Extended visual cryptography for natural images" Journal of WSCG. v10 i2. 303-310.
- [6] Jin, W. Q. Yan, and M. S. Kankanhalli, "Progressive color visual cryptography," J. Electron. Imag., vol. 14, no. 3, pp. 1–13, 2005.
- [7] Pim Tuyls, Henk D. L. Hollmann, Jack H. van Lint, and Ludo M. G. M. Tolhuizen. XOR-based visual cryptography schemes. Designs, Codes and Cryptography, 37(1):169–186, 2005

- [8] C.-N. Yang and D.-S. Wang, "Property analysis of XOR-based visual cryptography," IEEE Trans. Circuits Syst. Video Technol., vol. 24, no. 2, pp. 189–197, Feb. 2014.
- [9] X. Wu and W. Sun, "Extended capabilities for XOR-based visual cryptography," IEEE Trans. Inf. Forensics Security, vol. 9, no. 10, pp. 1592–1605, Oct. 2014.
- [10] E. Verheul and H. V. Tilborg, "Constructions And Properties Of K Out Of N Visual Secret Sharing Schemes." Designs, Codes and Cryptography, 11(2), pp.179–196, 1997.
- [11] G. Ateniese, C. Blundo, A. DeSantis, and D. R. Stinson, "Visual cryptography for general access structures", Proc. ICAL96, Springer, Berlin, 1996, pp.416-428.
- [12] Jin, W. Q. Yan, and M. S. Kankanhalli, "Progressive color visual cryptography," J. Electron. Imag., vol. 14, no. 3, pp. 1–13, 2005

Exploiting Social Relations for Efficient Routing in Delay Tolerant Network Environment

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Abstract: DTN is subclass of mobile ad hoc network (MANET) where instantaneous end-to-end connectivity is not available in source and destination nodes. Nodes in DTN are sparsely distributed. Frequent disconnections along with limited resources make routing in DTN more challenging. This paper proposes two routing protocols. One is Buddy Router with Time Window, which exploits social relations to maximize delivery probability. Another variant presented is Buddy Router with Replication, where controlled replication approach is used along with social metric for message forwarding. Detailed formulation of proposed work, along with comparative analysis, based on simulations is presented. The paper also presents impact of buffer size variation and TTL variation on routing performance of different routing protocols.

Keywords— Delay Tolerant Network (DTN), Routing, Opportunistic Routing and Pocket Switched Networks (PSN)

Key References -

- [1] Kevin Fall, "A Delay-Tolerant Network Architecture for Challenged Internets," Intel Research Berkley, 2003.
- [2] Maurice J. Khabbaz, Chadi M. Assi, and Wissam F. Fawaz, "Disruption-Tolerant Networking: A Comprehensive Survey on Recent Developments and Persisting Challenges" IEEE Communications Surveys & Tutorials, Vol. 14, No. 2, Second Quarter 2012
- [3] Yue Cao and Zhili Sun, Member, IEEE "Routing in Delay/Disruption Tolerant Networks: A Taxonomy, Survey and Challenges" IEEE Communications Surveys & Tutorials, Accepted For Publication.
- [4] R. J. D'Souza, Johny Jose, NIT Surathkal, "Routing Approaches in Delay Tolerant Networks: A Survey" 2010 International Journal of Computer Applications (0975 - 8887)
- [5] Artemios G. Voyatzis, Member, IEEE, "A Survey of Delay- and Disruption-Tolerant Networking Applications" JOURNAL of Internet Engineering, vol. 5, no. 1, June 2012
- [6] Ying Zhu, Bin Xu , Xinghua Shi, and Yu Wang "A Survey of Social-Based Routing in Delay Tolerant Networks: Positive and Negative Social Effects" IEEE Communications Surveys & Tutorials, Vol. 15, No. 1, First Quarter 2013

- [7] Kaimin Wei, Xiao Liang, and Ke Xu, "A Survey of Social-Aware Routing Protocols in Delay Tolerant Networks: Applications, Taxonomy and Design-Related Issues" IEEE Communications Surveys & Tutorials, Accepted For Publication
- [8] Paulo Rogerio Pereira, Augusto Casaca, Joel J. P. C. Rodrigues, Vasco N. G. J. Soares, Joan Triay, and Cristina Cervello-Pastor "From Delay-Tolerant Networks to Vehicular Delay-Tolerant Networks" IEEE Communications Surveys & Tutorials, Vol. 14, No. 4, Fourth Quarter 2012
- [9] Amin Vahdat and David Becker "Epidemic Routing for Partially-Connected Ad Hoc Networks" Technical Report CS-200006, Duke University, April 2000.
- [10] A. Lindgren, A. Doria "Probabilistic Routing Protocol for Intermittently Connected Networks" DTN Research Group, " ITRF 2012
- [11] J. Lakkakorpi, M. Pitkanen, and J. Ott, " Adaptive Routing in Mobile Opportunistic Networks" ACM MSWiM 2010, Bodrum, Turkey, Oct. 2010, pp. 101-109
- [12] P. Basu and S. Guha, "Effect of Limited Topology Knowledge on Opportunistic Forwarding in Ad Hoc Wireless Networks," Eighth International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WIOPT), Avignon, France, June 2010Buffer Management
- [13] T. Spyropoulos, K. Psounis and C. S. Raghvendra "Spray and Wait Efficient routing in intermittently connected Networks," in Proceeding of Mobile Computer and Communication review Vol. 7,no. 3, July 2003.
- [14] Burgess, J., Gallagher, B., Jensen, D., & Levine, B.N. (2006). MaxProp: Routing for Vehicle-based Disruption-Tolerant Networks. 25th IEEE International Conference on Computer Communications (INFOCOM 2006), 1-11.
- [15] Henri Dubois-Ferriere , Matthias Grossglauser , Martin Vetterli, Age matters: efficient route discovery in mobile ad hoc networks using encounter ages, Proceedings of the 4th ACM international symposium on Mobile ad hoc networking & computing, June 01-03, 2003, Annapolis, Maryland, USA [doi>10.1145/778415.778446]
- [16] Pan Hui, Jon Crowcroft, and Eiko Yoneki, "BUBBLE Rap: Social-Based Forwarding in Delay-Tolerant Networks" IEEE Transactions on Mobile Computing, Vol. 10, No. 11, November 2011
- [17] Eyuphan Bulut, Boleslaw K. Szymanski, "Exploiting Friendship Relations for Efficient Routing in Mobile Social Networks" IEEE Transactions On Parallel And Distributed Systems, Vol. 23, No. 12, December 2012
- [18] Tamer Abdelkader, Kshirasagar Naik, Amiya Nayak, Nishith Goel, and Vineet Srivastava "SGBR: A Routing Protocol for Delay Tolerant Networks Using Social Grouping" IEEE Transactions On Parallel And Distributed Systems (Accepted for Final Publication)
- [19] Shengling Wang And Min Liu, Xizhen Cheng, "Routing In Pocket Switched Networks" IEEE Wireless Communications, Feb 2012.
- [20] J. Scott, R. Gass, J. Crowcroft, P. Hui, C. Diot, and A. Chaintreau, "Data set cambridge/haggle," <http://crawdad.cs.dartmouth.edu/cambridge/haggle>, may 2009.
- [21] A. Pentland, R. Fletcher, and A. Hasson, "Daknet: Rethinking Connectivity In Developing Nations," Computer, vol. 37, no. 1, pp. 78 – 83, Jan. 2004.
- [22] A. Mtibaa, M. May, C. Diot and M. Ammar "Peoplerank: Social opportunistic forwarding", IEEE INFOCOM '10, 2010
- [23] Ajit Patil, Prakash Kulkarni "Buddy Router: Novel DTN Routing Algorithm using Multiparameter Composite Metric" RSC 2016

On Applying Document Similarity Measures for Template based Clustering of Web Documents

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Abstract: World Wide Web is the useful and easy way to get the source of information on the Internet. In order to reduce the content generation and publishing time, templates are used to populate the contents in web documents. Template provides easy access to the web document contents through their layout and structures. However, for search engines, due to its irrelevant terms, the templates degrade search engines accuracy and performance. Also the templates are used by wrapper induction tools used in information extractor to extract and integrate information from various E-commerce sites. Thus it has received a lot of attention to improve the search engines performance and content integration. In this paper we have discussed how heterogeneous web documents i.e web documents generated from different templates, can be clustered. We have applied document similarity measures to cluster the heterogeneous web documents generated from templates. Our experimental results on real data sets show that cosine distance similarity measure is more suitable for template based clustering of heterogeneous web documents.

Keywords— Template, Clustering, Cosine, Jaccard, Agglomerative Hierarchical Clustering

Key References -

- [1] Bar-Yossef, Z., Rajagopalan, S, "Template detection via data mining and its applications", WWW '02: Proceedings of the 11th International Conference on World Wide Web, New York, NY, USA, ACM Press 580–591, 2002.
- [2] Lin, S.H., Ho, J.M, "Discovering informative content blocks from web documents", KDD '02: Proceedings of the eighth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, New York, NY, USA, ACM Press 588–593, 2002.
- [3] Debnath, S., Mitra, P., Giles, C.L, "Automatic extraction of informative blocks from webpages", SAC '05: Proceedings of the 2005 ACM Symposium on Applied Computing, New York, NY, USA, ACM Press 1722–1726, 2005.
- [4] Yi, L., Liu, B., Li, X, "Eliminating noisy information in web pages for data mining", KDD '03: Proceedings of the ninth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, New York, NY, USA, ACM Press 296–305, 2003

- [5] [5] Reis, D.C., Golher, P.B., Silva, A.S., Laender, A.F, "Automatic web news extraction using tree edit distance", WWW '04: Proceedings of the 13th International Conference on World Wide Web, New York, NY, USA, ACM Press 502–511,2004
- [6] Gibson, D., Punera, K., Tomkins, A,"The volume and evolution of web page templates", WWW '05: Special Interest Tracks and Posters of the 14th International Conference on World Wide Web, New York, NY, USA, ACM Press ,830–839,2005
- [7] Cruz, I.F., Borisov, S., Marks, M.A., Webbs, T.R, "Measuring structural similarity among web documents : preliminary results", EP '98: Proceedings of the 7th international Conference on Electronic Publishing, Artistic Imaging, and Digital Typography,.513 – 524, 1998
- [8] Buttler, D,"A short survey of document structure similarity algorithms", IC '04: Proceedings of theInternational Conference on Internet Computing, CSREA Press 3–9, 2004
- [9] Broder, A.Z., Glassman, S.C., Manasse, M.S., Zweig, G, "Syntactic clustering of the web", Computer Networks 29(8-13) 1157–1166, 1997
- [10] A. Arasu and H. Garcia-Molina, "Extracting Structured Data from Web Pages", Proc. ACM SIGMOD, 2003.
- [11] M. de Castro Reis, P.B. Golher, A.S. da Silva, and A.H.F. Laender, "Automatic Web News Extraction Using Tree Edit Distance", Proc. 13th Int'l Conf. World Wide Web (WWW), 2004.
- [12] M.N. Garofalakis, A. Gionis, R. Rastogi, S. Seshadri, and K. Shim, "Xtract: A System for Extracting Document Type Descriptors from Xml Documents", Proc. ACM SIGMOD, 2000.
- [13] Y. Zhai and B. Liu,"Web Data Extraction Based on Partial Tree Alignment", Proc. 14th Int'l Conf. World Wide Web (WWW), 2005.
- [14] V. Crescenzi, G. Mecca, and P. Merialdo,"Roadrunner: Towards Automatic Data Extraction from Large Web Sites", Proc. 27th Int'l Conf. Very Large Data Bases (VLDB), 2001.
- [15] K. Vieira, A.S. da Silva, N. Pinto, E.S. de Moura, J.M.B. Cavalcanti, and J. Freire,"A Fast and Robust Method for Web Page Template Detection and Removal", Proc. 15th ACM Int'l Conf. Information and Knowledge Management (CIKM), 2006.
- [16] S. Zheng, D. Wu, R. Song, and J.-R. Wen, "Joint Optimization of Wrapper Generation and Template Detection", Proc. ACMtiSIGKDD, 2007.
- [17] Chulyun Kim and Kyuseok Shim, "TEXT: Automatic Template Extraction from Heterogeneous Web Pages", IEEE Transaction on Knowledge and Data Engineering, 2011

Architecture for Personalized Meta Search Engine

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Abstract: Information available on the web is growing rapidly. A major problem in web search is that the interactions between the users and search engines are limited by the factors like unknown capabilities of search engines adopted, and ill-constructed query by the user. Hence the user has to repeatedly apply the several queries till he reaches the pages of most interest.

Any search engine can give its best performance if well-constructed and detailed queries are used. As a result, the users tend to submit shorter/ insufficient/ ambiguous queries yielding unwanted search lists. In order to return highly relevant results to the users, search engines must be able to profile the users' interests and personalize the search results according to the users' profiles. This paper discusses the need and specific requirements of personalized search engine, its architecture, the prototype model developed and the results obtained. Also sample sessions performed on the designed model have been given for selected user profile.

Keywords— Web Search Engines, Personalized Web Searching, Meta Search Engines.

Key References -

- [1] K Wai-Ting Leung, D Lee, W Lee, "PMSE: A Personalized Mobile Search Engine", IEEE Transactions On Knowledge And Data Engineering, Vol. 25, Issue: 4, pp.820-834, April 2013.
- [2] S. Prakasha, H.Shashidhar, G.T. Raju, "Structured Intelligent Search Engine for Effective Information Retrieval using Query Clustering Technique and Semantic Web", International Conference on Contemporary Computing and Informatics (IC3I), 688 695, DOI: 10.1109/IC3I.2014.7019820.
- [3] A Annadurai, "Architecture of personalized web search engine using suffix tree clustering", International Conference on Signal Processing, Communication, Computing and Networking Technologies (ICSCCN 2011), pp. 604-608, 2011.
- [4] K.W.-T. Leung, W. Ng, and D.L. Lee, "Personalized Concept-Based Clustering of Search Engine Queries," IEEE Trans. Knowledge and Data Eng., vol. 20, no. 11, pp. 1505-1518, Nov. 2008.
- [5] J. Teevan, S.T. Dumais, and E. Horvitz., "Personalizing Search via Automated Analysis of Interests and Activities. Proceedings of the 28th Annual International ACM SIGIR" Conference on Research and development in information retrieval (SIGIR'05), pages 449–456, 2005.

- [6] Adah, S.; Bufl, C.; Temtanapat, Y., "Integrated Search Engine", @IEEE Knowledge and Data Engineering Exchange Workshop, 1997. Pages: 140 – 147.
- [7] O. Zamir, O. Etzioni, "A Dynamic Clustering interface to Web search results," Computer Networks, Netherlands, Amsterdam, 31(11-16):1361-1374, 1999.
- [8] M. Ilic, P. Spalevic, M. Veinovic, "Suffix Tree Clustering – Data mining algorithm", Twenty-Third International Electrotechnical and Computer Science Conference ERK'2014, Portorož, ISSN 1581-4572, pp. 15-18, September 22-24, 2014.
- [9] K A Heller, Z Ghahramani. "Bayesian hierarchical clustering", Proceedings of the 22nd international conference on Machine learning, pp. 297-304, 2005.
- [10] R.E. Ruviaro Christ, E. Talavera, C. Maciel, "Gaussian Hierarchical Bayesian Clustering Algorithm", ISDA 2007, pp. 133-13.

Contextualized System for Active-Learning Using Mobile Computing

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Abstract: In response to a query, providing a reliable and relevant answer has been considered as a challenging task. Contextualized satisfaction of a query is equally challenging. In order to design contextualized system, various dimensions like profile of object, location, time etc. are taken into consideration. To deal with these dimensions effectively in a query processing, different types of layered strategies have been designed that focus on the object query, expansion of that query with semantic analysis. Dimensions help to deliver content efficiently and effectively. This paper mainly focuses on context aware effective query processing for active learning with the help of different layers, namely: presentation, context management and knowledgebase in a mobile computing environment.

Keywords— Semantic analysis, Context aware system, Natural language processing.

Key References -

- [1] Sukanta Ganguly, "CADRA: context aware data retrieval architecture", Int. J. Advanced Intelligence Paradigms, Vol. 3, No. 1, 2011.
- [2] Jones, Gareth JF, and Peter J. Brown, "Context-aware retrieval for ubiquitous computing environments.", In Workshop on Mobile and Ubiquitous Information Access, pp. 227-243. Springer, Berlin, Heidelberg, 2003.
- [3] Mouna Abdelkefi, Ilhem Kallel, "Conversational Agent for Mobile-Learning: A review and a Proposal of a Multilanguage Text-To-SpeechAgent,"MobiSpeech""", In Research Challenges in Information Science (RCIS), 2016 IEEE Tenth International Conference on, pp. 1-6. IEEE, 2016.
- [4] Namiot, Dmitry, and Manfred Sneps-Sneppe, "Context-aware data discovery.", In Intelligence in Next Generation Networks (ICIN), 2012 16th International Conference on, pp. 134-141. IEEE, 2012.
- [5] Schlotterer, Jörg, Christin Seifert, Wolfgang Lutz, and Michael Granitzer, "From context-aware to context-based: Mobile just-in-time retrieval of cultural heritage objects.", In European Conference on Information Retrieval, pp. 805-808. Springer, Cham, 2015.

- [6] Limbu, Dilip K., Andrew M. Connor, Russel Pears, and Stephen G. MacDonell, "Improving web search using contextual retrieval.", In Information Technology: New Generations, 2009. ITNG'09. Sixth International Conference on, pp. 1329-1334. IEEE, 2009.
- [7] Bayrak, Coskun, and Hemant Joshi, "Learning contextual behavior of text data.", In Machine Learning and Applications, 2005. Proceedings. Fourth International Conference on, pp. 6-pp. IEEE, 2005.
- [8] Zhao, Rui, Kezhi Mao, Rui Zhao, and Kezhi Mao, "Topic-Aware Deep Compositional Models for Sentence Classification." IEEE/ACM Transactions on Audio, Speech and Language Processing (TASLP) 25, no. 2 (2017): 248-260.
- [9] Gómez, Jorge E., Juan F. Huete, and Velssy L. Hernandez, "A contextualized system for supporting active learning," IEEE Transactions on Learning Technologies 9, no. 2 (2016): 196-202.

Review of Open-Source BCI approach using OpenViBE

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Abstract: Brain-Computer Interface (BCI) is a communication method that allows users to pass on information to computers by means of human brain activity. This paper reviews the analysis and measurement of Electroencephalography (EEG) signal using a BCI software system – OpenViBE. This software allows neurological researchers to construct, experiment and simulate Brain-Computer Interface. Although, there exists various hardware equipment in the market for recording brain activity and software platforms for analyzing those signals. Here, Neurosky Mindwave EEG headband is used for measuring EEG signals for certain human brain activity and OpenViBE is used for analysis of these signals. The OpenViBE software is offered for free and can be distributed under an open-source license. Primarily, connecting EEG devices with OpenViBE BCI software and storing the recorded values in the form of files requires certain procedures to be followed which are highlighted here. OpenViBE software comprises an Acquisition Server, which takes care of establishing a connection with various types of EEG devices and Designer part is essentially required to simulate scenarios using various EEG processing modules. OpenViBE uses an integrated approach for online as well as offline analysis of EEG data. Secondarily, simple processing modules of OpenViBE and the techniques to adjust parameters of these modules are reviewed here. Learning to analyze and measure signals from EEG sensors using OpenViBE, allow researchers and BCI enthusiast to explore in a numerous areas of BCI.

Keywords— Bio-signals, BCI, EEG, OpenViBE, Neurosky Mindwave

Key References -

- [1] A. K. Jain, A. Ross, and S. Prabhakar. "An introduction to biometric recognition."IEEE Transactions on circuits and systems for video technology14, no. 1 (2004): 4-20.
- [2] Y. H.Tai, Y. J. Tian, T. W. Huang, and K. T. Sun. "Brainwave technology gives Internet access to the physically disabled." In Intelligent Systems (GCIS), 2013 Fourth Global Congress on, pp. 331-335. IEEE, 2013.

- [3] C. Eswari, S. K. Ramya, "Biometrics using headgear to scan brainwaves." In Innovations in Emerging Technology (NCOIET), 2011 National Conference on, pp. 95-98. IEEE, 2011.
- [4] M. Teplan "Fundamentals of EEG measurement." Measurement science review2, no. 2(2002): 1-11.
- [5] G. H.Klem, H. O. Lüders, H. H. Jasper, and C. Elger. "The ten-twenty electrode system of the International Federation." Electroencephalogr Clin Neurophysiol52, no. 3 (1999): 3-6.
- [6] Z. Mahmoodin, W. Mansor, K. Y. Lee, and N. B. Mohamad. "Processing of electroencephalogram signals using OpenVibe." In Region 10 Symposium, 2014 IEEE, pp. 563-567. IEEE, 2014.
- [7] Y. Renard, F. Lotte, G. Gibert, M. Congedo, E. Maby, V. Delannoy, O. Bertrand, and A. Lécuyer. "OpenViBE: an open-source software platform to design, test, and use brain-computer interfaces in real and virtual environments."Presence: teleoperators and virtual environments19, no. 1 (2010): 35-53.

Factored Language Modeling

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Abstract: Language modeling is a technique for finding the next most probable word in a sentence. It is first and essential task for successful implementation of some natural language processing applications like machine translation and speech recognition. It ensures for correctness and fluency of the target output in these applications. N-gram is a traditional way to implement language model in which only previous words in the sentence are used to predict the probable next word in the sentence. Factored language modeling is a method to utilize linguistic knowledge of the word along with the word itself for constructing the language model. The paper describes the factored language modeling technique and compares the results obtained against the traditional n-gram technique using perplexity as a measure.

Keywords — Language model, Perplexity, Factored language model, Backoff

Key References -

- [1] R. Rosenfeld, "Two decades of statistical language modeling: where do we go from here?", In the Proceedings of the 2000 IEEE International conference, Vol. 88, Issue. 8 pp. 1270–1278, 2000.
- [2] S. F. Chen, J. Goodman, "An Empirical Study of Smoothing Techniques for Language Modeling" , In the Proceedings of the 1996Thirty-Fourth Annual Meeting of the Association for Computational Linguistics, San Francisco, pp 310-318, 1996.
- [3] J.A. Bilmes, K. Kirchhoff, "Factored Language Models and Generalized Parallel Backoff ",In the Proceedings of the 2003 HLT/NAACL, pp 4-6, 2003.
- [4] K. Kirchhoff, J. Bilmes, K. Duh, "Factored Language Models Tutorial", University of Washington, 2016.
- [5] A. E. Axelrod, "Factored Language Models for Statistical Machine Translation", University of Edinburgh, 2006.
- [6] A. Stolcke, "SRILM- an Extensible Language Modeling Toolkit", In the Proceedings of the 2002International Conference on Spoken Language Processing, Denver, Colorado, September 2002.

- [7] A. Stolcke, J. Wheng, W. Wang, V. Abrash, "SRILM at Sixteen: Update and Outlook", In the Proceedings of the 2011 IEEE Automatic Speech Recognition and Understanding Workshop, Waikoloa, 2011.
- [8] K. Duh, K. Kirchhoff, "Automatic Learning of Language Model Structure", In the Proceedings of the 2004 International Conference on Computational Linguistics (COLING), 2004.
- [9] E. M. deNovais, "Portuguese Text Generation Using Factored Language Models", J. Brazilian Computation Society, Vol. 19, Issue. 2, pp 135–146, 2013.
- [10] M. Lazăr, D. Militaru, "A Romanian Language Modeling Using Linguistic Factors", In the Proceedings of the 2013 7th Conference in Speech Technology and Human - Computer Dialogue (SpeD), Cluj-Napoca, , pp. 1–6, 2013.
- [11] I. Kipyatkova, A. Karpov, "Study of Morphological Factors of Factored Language Models for Russian ASR",In the Proceedings of the 2014 SPECOM 2014, Novi Sad, pp. 451–458, 2014.
- [12] H. Sak, M. Saraçlar, T. Güngör, "Morphology Based and Sub Word Language Modeling for Turkish Speech Recognition", In the Proceedings of the 2010 ICASSP, Dallas, pp. 5402–5405, 2010.
- [13] A. Mousa, M. Shaik, R. Schlüter, H. Ney, "Morpheme Based Factored Language Models for German LVCSR",In the Proceedings of the 2011 INTERSPEECH, Florence, pp. 1053–1056, 2011.
- [14] Z. Alumae, "Sentence Adapted Factored Language Model for Transcribing Stonian Speech", In the Proceedings of the 2006 ICASSP, Toulouse, pp. 429–432, 2006.
- [15] T. Hirsimaki, J. Pylkkonen, M. Kurimo, "Importance of High-Order N-Gram Models in Morph-Based Speech Recognition", IEEE Trans. Audio, Speech, Lang. Process. , Vol. 17, Issue. 4, pp. 724–732, 2009.
- [16] H. Adel, NT. Vu, K. Kirchhoff, D. Telaar, T. Schultz, "Syntactic and Semantic Features for Code-Switching Factored Language Models", IEEE/ACM Trans. Audio, Speech, Lang. Process, Vol. 23, Issue. 3, pp. 431–440, 2015.

Outdoor Natural Scene Object Classification Using Probabilistic Neural Network

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Abstract: Region labeling for outdoor scenes to identify sky, green land, water, snow etc. facilitates content-based image retrieval systems. This paper presents use of multiple features to classify various objects of the outdoor natural scene image. Proposed system aims to classify images of the sky, water and green land. As all these nature components are irregular in shape, they can be classified using color and texture features. Color features of the object are extracted by using segmentation in La*b* color space. In the process of texture feature calculation, the image is initially divided into smaller grids. Global GLCM based statistical texture features are calculated using statistical features of these local grids. Results show that color and statistical texture features are not sufficient to differentiate sky and water body. To achieve discrimination between these two objects, a new edge-based horizontal line-texture feature is proposed. The proposed feature is used to differentiate between sky and water objects based on the density of horizontal lines. All these features are used together to train probabilistic neural network for classification. The system has achieved improvement of 5% to 8% in F-measure, when all these features are used together for classification of natural scene objects.

Keywords— Color Feature, Statistical texture features, Horizontal line texture feature, Image classification, PNN

Key References -

- [1] Da Silva Júnior, João Augusto, Rodney Elias Marçal, and Marcos Aurélio Batista. "Image Retrieval: Importance and Applications." Workshop de Visão Computacional-WVC. 2014.
- [2] http://www.leeds.ac.uk/educol/documents/00001240.htm#_Toc442192675
- [3] Bora, Dibyajyoti, Anil Kumar Gupta, and Fayaz Ahmad Khan. "Comparing the performance of L* A* B* and HSV color spaces with respect to color image segmentation." arXiv preprint arXiv:1506.01472 (2015).
- [4] He, Zhen, et al. "Robust road detection from a single image using road shape prior." Image Processing (ICIP), 2013 20th IEEE International Conference on. IEEE, 2013.

- [5] Bappy, Jawadul H., et al. "Real Estate Image Classification." Applications of Computer Vision (WACV), 2017 IEEE Winter Conference on. IEEE, 2017.
- [6] Jomaa, Hadi S., YaraRizk, and Mariette Awad. "Semantic and Visual Cues for Humanitarian Computing of Natural Disaster Damage Images." Signal-Image Technology & Internet-Based Systems (SITIS), 2016 12th International Conference on. IEEE, 2016.
- [7] Park, Soo Beom, Jae Won Lee, and Sang Kyo Kim. "Content-based image classification using a neural network." Pattern Recognition Letters 25.3 (2004): 287-300.
- [8] Varior, Rahul Rama, and Gang Wang. "A data-driven color feature learning scheme for image retrieval." Acoustics, Speech and Signal Processing (ICASSP), 2015 IEEE International Conference on. IEEE, 2015.
- [9] Singhal, Amit, Jiebo Luo, and Weiyu Zhu. "Probabilistic spatial context models for scene content understanding." Computer Vision and Pattern Recognition, 2003. Proceedings. 2003 IEEE Computer Society Conference on. Vol. 1. IEEE, 2003.
- [10] Kang, Sanggil, and Sungjoon Park. "A fusion neural network classifier for image classification." Pattern Recognition Letters30.9 (2009): 789-793.
- [11] Chow, Tommy WS, and M. K. M. Rahman. "A new image classification technique using tree-structured regional features." Neurocomputing 70.4 (2007): 1040-1050.
- [12] Aditya Vailaya, Anil K. Jain, "Detecting sky and vegetation in outdoor images", Proc. SPIE 3972, Storage and Retrieval for Media Databases 2000.
- [13] Luo, Jiebo, and Andreas Savakis. "Indoor vs outdoor classification of consumer photographs using low-level and semantic features." Image Processing, 2001. Proceedings. 2001 International Conference on. Vol. 2. IEEE, 2001.
- [14] Serrano, Navid, Andreas Savakis, and A. Luo. "A computationally efficient approach to indoor/outdoor scene classification." Pattern Recognition, 2002. Proceedings. 16th International Conference on. Vol. 4. IEEE, 2002.
- [15] Feng, Xiaojuan, Christopher KI Williams, and Stephen N. Felderhof. "Combining belief networks and neural networks for scene segmentation." IEEE Transactions on Pattern Analysis and Machine Intelligence 24.4 (2002): 467-483.
- [16] Boutell, Matthew R., Jiebo Luo, and Christopher M. Brown. "Improved semantic region labeling based on scene context." Multimedia and Expo, 2005. ICME 2005. IEEE International Conference on. IEEE, 2005.
- [17] Vailaya, Aditya, et al. "Image classification for content-based indexing." IEEE transactions on image processing 10.1 (2001): 117-130.
- [18] Quelhas, Pedro, et al. "A thousand words in a scene." IEEE transactions on pattern analysis and machine intelligence 29.9 (2007).
- [19] Perronnin, Florent. "Universal and adapted vocabularies for generic visual categorization." IEEE Transactions on pattern analysis and machine intelligence 30.7 (2008): 1243-1256.
- [20] Mylonas, Phivos, et al. "Using visual context and region semantics for high-level concept detection." IEEE Transactions on Multimedia 11.2 (2009): 229-243.
- [21] Patra, Prashant Kumar, et al. "Probabilistic neural network for pattern classification." Neural Networks, 2002. IJCNN'02. Proceedings of the 2002 International Joint Conference on. Vol. 2. IEEE, 2002.
- [22] Othman, MohdFauzi, and MohdAriffananMohdBasri. "Probabilistic neural network for brain tumor classification." Intelligent Systems, Modelling and Simulation (ISMS), 2011 Second International Conference on. IEEE, 2011.

- [23] Sawant, Shreepad S., and Preeti S. Topannavar. "Introduction to Probabilistic Neural Network—Used For Image Classifications." International Journal of Advanced Research in Computer Science and Software Engineering 5.4 (2015): 279-283.
- [24] Sridhar, D., and IV Murali Krishna. "Face image classification using combined classifier." Signal Processing Image Processing & Pattern Recognition (ICSIPR), 2013 International Conference on. IEEE, 2013.
- [25] Beale, Mark Hudson, Martin T. Hagan, and Howard B. Demuth. "Neural network toolbox 7." User's Guide, MathWorks 2 (2010): 77-81.

Accelerating performance of Convolutional Neural Network for Face Expression Recognition

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Abstract— Facial expression recognition (FER) system detects human's emotion using their expression in the input image. It classifies expression into one of categories -sad, happy, disgust, fear, surprise, angry, neutral. Traditional systems are based on machine learning techniques. The training time is critical issue in these approaches. The advanced development is applying deep learning which is better approach which will accelerate the performance of the model. Convolutional Neural Network (CNN) is often used in object recognition and detection. We describe the basic structure of CNN and exhibit the speedup in training that can be achieved by shifting the computation intensive task of CNN to the GPU. In this paper we studied the method of learning and classification of CNNs on the GPU (Graphical Processing Unit) which accelerate the performance and scalability. We build a deep learning Convolutional Neural Network (CNN) model for facial expression recognition using Theano and Caffe libraries. The result demonstrated that GPU version works better than CPU version of training the model.

Keywords— Deep Learning, Graphical Processing Unit, Convolutional Neural Network (CNN).

Key References -

- [1] P. Y. Simard, D. Steinkraus, and J. C. Platt, "Best Practices for Convolutional Neural Networks Applied to Visual Document Analysis", Proc. of the 7th Int. Conference on Document Analysis and Recognition, 2003, pp. 958–962
- [2] Stefan Podlipnig Daniel Strigl, Klaus Kofler, "Performance and scalability of GPU based convolutional neural networks.", IEEE 2010
- [3] Shashank Bajpai , "Implementing Convolutional Neural Network with Parallel Computing using CUDA, IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 11, November 2015
- [4] <https://www.kaggle.com/c/challenges-in-representation-learning-facial-expression-recognition-challenge>. www.kaggle.com. [Online] 2013.
- [5] Rothkrantz, M. Pantic and J.M. "Facial action recognition for facial expression analysis from static face images." 2004: IEEE Transactions on Systems,, Vol. 34(3).

- [6] Hinton, Geoffrey E., Osindero, Simon, Teh, Yee-Whye. "A fast learning algorithm for deep belief nets: Neural Computation," 2006, p. 16.
- [7] Krizhevsky, Alex, Ilya Sutskever, and Geoffrey. "Imagenet classification with deep convolutional." s.l. : Advances in neural information processing systems, 2012.
- [8] James Bergstra, Olivier Breuleux, Frédéric Bastien, Pascal Lamblin, Razvan Pascanu, Guillaume Desjardins. "Theano: A CPU and GPU Math Compiler in Python. "2010. PROC. OF THE 9th PYTHON IN SCIENCE CONF. (SCIPY 2010). p. 7.

Tightly Bound Community Detection Algorithm for Social Network

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Abstract— Community detection is basic for the study of social network. A community detection is finding a related component in the graph of social network. In its basic form a community is a set of connected users in the social network. It is observed that all connected users may or may not have same opinion and topic of interest. The purpose of this experiment is to find of set of users who have same topic of interest. In this paper an algorithm for finding out tightly bound community is proposed. This algorithm detects the topics of the data generated by the user of social network. For this purpose the tweets generated by the users are processed through topic detection algorithm. These topics are attached as profile of the user and users with same topic profile are collected to form a community. The algorithm is tested for various size of Twitter user dataset. The statistics of the detected communities are derived

Keywords— Social Network, Topic Extraction, Community Detection

Key References -

- [1] A. Jaradat, R.M. Al-Zoubi, "Community detection using network structure", in the proceedings of 2017 8th International Conference on Information Technology, Malaysia,755-760
- [2] X.Wang, G.Liu, J. Li,, "Overlapping community detection based on structural centrality in complex network", IEEE access, vol 5, pp 25258-25269, 2017.
- [3] C.S. Chang, D.S. Lee, L. H. Liu, S.M. Liu, M.H. Wu, "A Probabilistic Framework for Structural Analysis and Community Detection in Directed Networks", IEEE transaction on network, vol-issue-99, pp 1-16, 2017.
- [4] X. Zhang, G. Cao, "Transient community detection and its application to data forwarding in delay tolerant network",in the proceedings of 21st international conference on network protocol, Germany, 128-139, 2017.
- [5] P. Tantotai, J. Srisittimongkol, W. Rukijkpanich, S.Tuarob, "mipMap:A mobile application for proximate social network community", In proceedings of 6th ICT international student project conference, Malaysia, 312-316, 2017.
- [6] Y. Zhou, Y. Li, Z. Wang, Y. Luo, X. Yang, "Identification of influential spreaders in geo-social network", 2017 25th international conference on geoinformatics, USA, 2017.
- [7] K. Duraisamy, H. Lu, P. P. Pande, A. Kalyanaraman, "Accelerating Graph Community Detection with Approximate Updates via an Energy-Efficient NoC", In Proceedings of the 54th Annual Design Automation Conference 2017 (DAC '17). ACM, New York, NY, USA, Article 89, 6 pages, 2017.

- [8] G.Li, K. Guo, Y. Chen, L. Wu, D. Zhu, "A dynamic community detection algorithm based on Parallel Incremental Related Vertices", in the proceeding of 2nd international conference on big data analysis, China, 779-783, 2017.
- [9] A. Aylani, N. Gupta, "community detection in social network based on user's social activity", in the proceeding of 2nd international conference on social mobile analytics and cloud, India, 625-628, 2017.
- [10] Andrea Lancichinetti and Santo Fortunato. Benchmarks for testing community detection algorithms on directed and weighted graphs with overlapping communities. *Physical Review E*, 80(1):016118, 2009.
- [11] B.D. Le, H.X.Nguyen, H. Shen, N. Falkner, "GLFR:A generalized LFR benchmark for testing community detection algorithms", in the proceeding of 26th international conference on computer communication and network, Canada, 2017.
- [12] M. Wang, C. Wang, J.X. Yu, J. Zhang, "Community Detection in Social Networks: An In depth Benchmarking Study with a Procedure Oriented Framework", *Journal of VLDB Endowment*, vol-8, issue-10, 998-1009, June 2015.
- [13] P. Bedi, C. Sharma, "Community detection in social network", *WIREs Data Mining Knowl Discov*, 6: 115–135. doi:10.1002/widm.1178
- [14] McCallum, Andrew Kachites. "MALLET: A Machine Learning for Language Toolkit." <http://mallet.cs.umass.edu>. 2002.
- [15] Cuckoo project, <http://user.informatik.uni-goettingen.de/~txu/cuckoo/index.html>

Study of Detection of An Intrusion Using FilterBased Feature Selection Algorithm

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Abstract— To diagnose or segregate an anomalous performance in a network, an intrusion detection system is required. Due to protracted network connectivity of computer system, the system needs to be more impressionable to intrusion. Nowadays computer system has become an indispensable burden for network administrator since they have become the target of apprehensive demeanor. Intrusion detection system is handling considerable counter techniques like changing intrusion's content, blocking intrusion or uncertain security circumstances but one of the dominant problems encountered by an intrusion detection system is an enormous amount of false positive alerts. The system identifies distinct intrusion by an untrusted person. The system is mainly interested to identify four primary kinds of attacks like a probe, dos, u2r and r2l. This paper presents a study of detection of an intrusion using filter-based feature selection algorithm. An IDS is based on support vector machine which uses the least square (ls-svm) algorithm. The study shows that this algorithm achieved improved accuracy and reduced computational cost in comparison with other intrusion detection techniques.

Keywords—Detection of Intrusion, Selection of feature, Collective intelligence, ls-svm

Key References -

- [1] M. Kahani and A. N. Toosi, "A new way of attack recognition centered on a transformative smooth processing design using neuro-fuzzy classifiers," Computer Communication. vol. 30, no. 10, pp. 2201-2212, 2007.
- [2] R. P. Liu, Z. Tan, A. Jamdagni, X. He, P. Nanda and J. Hu, "Detection of Denial-of-Service Attacks Based on Computer Vision Techniques," in IEEE Transactions on Computers, vol. 64, no. 9, pp. 2519-2533, Sept. 1, 2015.
- [3] A. H. Sang and S. Mukkamala, "Significant function choice using computational brilliant techniques for attack recognition," in Proc. Adv. Methods Knowledge. Finding Complicated Details, 2005, pp. 285-306.

- [4] M. RezaeiYousefi, F. Amiri, C. Lucas, A. Sharkey, and N. Yazdani, "Mutual information centered function choice for attack recognition techniques," *J. Netw. Comput. Appl.*, vol. 34, no. 4, pp. 1184-1199, 2011.
- [5] R.J. Chen, S. J. Horng, M.Y. Su, Y.H. Chen, T.W. Kao, J.L. Lai, and C. D. Perkasa, "A novel attack recognition program centered on ordered clustering and assistance vector devices," *Professional Syst. with Appl.*, vol. 38, no. 1, pp. 306-313, 2011.
- [6] Y. Chen, A. Abraham, and B., "Feature choice and category versatile sensory shrub," *Neuro-computing*, vol.70, no. 1, pp. 305-313, 2006.
- [7] Nguyen Thanh Van, Tran Ngoc Thinh, and Le Thanh Sach, "An anomaly-based network intrusion detection system using Deep learning," *2017 International Conference on System Science and Engineering (ICSSE)*, Ho Chi Minh City, 2017, pp. 21.
- [8] M. Ambusaidi, X. He, P. Nanda, and Z. Tan, "Building an intrusion detection system using a filter-based feature selection algorithm", *IEEE Trans. Comput.*, vol. PP, no. 99, p. 1, 2016.
- [9] M. Tavallaei, E. Bagheri, W. Lu, and A. A. Ghorbani, "A detailed analysis of the KDD CUP 99 data set," *IEEE Symp. Comput. Intell. Secur. Def. Appl. CISDA* 2009, no. Cisda, pp. 1–6, 2009.
- [10] J. A. K. Suykens and J. Vandewalle, "Least Squares Support Vector Machine Classifiers," *Neural Process. Lett.* 9, pp. 293–300, 1999.

Data Duplicate Detection: A Survey

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Abstract—Duplicates arise when there are multiple representations of the same real-world entities. The process of identifying these duplicates is known as duplicate detection. Duplicates may cause a lot of problems and confusion while managing the database and thus need to be eliminated. Normally for a small dataset, the process of duplicate detection does not take long and thus it is efficient. But if the dataset is larger, then the process takes a long time, sometimes as long as some days. This paper covers various techniques that are used to detect duplicates and also discusses the drawbacks of these techniques and how they can be improved.

Keywords—Duplicate Detection, Data cleaning, Windowing, Blocking

Key References -

- [1] H. B. Newcombe and J. M. Kennedy, "Record linkage: Making maximum use of the discriminating power of identifying information," *Communication ACM*, vol. 5, no. 11, pp. 563–566, 1962.
- [2] M. A. Hernandez and S. J. Stolfo, "Real-world data is dirty: Data cleansing and the merge/purge problem," *Data Mining Knowledge Discovery*, vol. 2, no. 1, pp. 9–37, 1998.
- [3] U. Draisbach and F. Naumann, "A generalization of blocking and windowing algorithms for duplicate detection," in *Proc. Int. Conf. Data Knowledge Eng.*, 2011, pp. 18–24.
- [4] U. Draisbach, F. Naumann, S. Szott, and O. Wonneberg, "Adaptive windows for duplicate detection," in *Proc. IEEE 28th Int. Conf. Data Eng.*, 2012, pp. 1073–1083.
- [5] S. E. Whang, D. Marmaros, and H. Garcia-Molina, "Pay-as-you-go entity resolution," *IEEE Trans. Knowledge Data Eng.*, vol. 25, no. 5, pp. 1111–1124, May 2012.
- [6] K. Elmagarmid, P. G. Ipeirotis, and V. S. Verykios, "Duplicate record detection: A survey," *IEEE Trans. Knowledge Data Eng.*, vol. 19, no. 1, pp. 1–16, Jan. 2007.
- [7] F. Naumann and M. Herschel, *An Introduction to Duplicate Detection*, San Rafael, CA, USA: Morgan & Claypool, 2010.

A Review on RFID Technology and its Applications in M2M Communication Systems

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Abstract—Machine to Machine (M2M) communications system aims to enable information exchange between smart devices and objects, such as sensors, actuators, robots, etc. M2M communication system is a key feature of remote control, warehouse management, traffic control, logistic services, supply chain management, robotics and telemedicine. This paper outlines the Radio Frequency Identification Technology (RFID), which is spreading significantly around the globe. RFID Technology is counted in one of the methods of automatic identification technology and is also grouped under automated data collection technology. RFID assists microcontrollers, tablets, computers, etc. to identify or track objects, record metadata, etc. Compared to the barcode identification system RFID system is advantageous in many parameters and is replacing the barcode technology in various industries. RFID is progressively used for tracking people, biometric authentication technologies for security, library automation, indoor navigation, supermarket mall systems, etc. This paper concludes with the discussion of improvement in business lines with the usage of RFID Technology for M2M applications and required future work in M2M communications.

Keywords—RFID Technology, RFID Components, Machine to Machine Communications

Key References -

- [1] Z. Meng and Z. Wu, "A Data-Oriented M2M Messaging Mechanism for Industrial IoT Applications", IEEE Internet of Things Journal, Vol.4, Issue.1, pp. 236-246, 2017.
- [2] X. Jia, Q. Feng, T. Fan, and Q. Mohammad, "RFID Technology and Its Applications in Internet of Things (IOT)", In the Proceedings of the 2012 IEEE Conference, pp. 1282-1285, 2012.
- [3] C. Jechlitschek, "A survey Paper on Radio Frequency Identification (RFID) Trends", Unpublished.
- [4] M. Kaur, M. Sandhu, N. Mohan and P. Sandhu, "A Data-Oriented M2M Messaging Mechanism for Industrial IoT Applications", International Journal of Computer and Electrical Engineering, Vol.3, Issue.1, pp. 1793-8163, 2011.
- [5] T. Hassan and S. Chatterjee, "A Taxonomy for RFID", In the Proceedings of the 39th Hawaii International Conference on System Sciences, 0-7695-2507-5/06/\$20.00 (C) 2006 IEEE, 2006.

- [6] Z. Chen and X. Qing, "Antennas for RFID Applications", 978-1-4244-4885-2/10/\$25.00 ©2010 IEEE, 2010.
- [7] Luo, and Xiaodong, "Performance Impact of Addressing Modes on Encryption Algorithms", In the Proceedings of the 2012 Second International Conference on Business Computing and Global Informatization, pp. 717-720, 2012.
- [8] C. Saranya, "Enactment of Smart Library Management System Exercising Ubiquitous Computing", Contemporary Engineering Sciences, Vol.4, Issue.11, pp. 501-507, 2014.
- [9] C. Jadhav, S. Jadhav, V. Sancheti, and S. Hajare, "Library Management System Using Rfid Technology", International Research Journal of Engineering and Technology (IRJET), Vol.4, Issue.5, pp. 2831-2834, 2017.
- [10] M. Mohammad, "An RFID-Based Library Management System Using Smart Cabinets: A Pilot Project", In the Proceedings of the 8th European Conference on Antennas and Propagation (EuCAP 2014), pp. 2954-2955, 2014.
- [11] A. Zanella, and L. Vangelista, "A Internet of Things for Smart Cities", IEEE Internet of Things Journal, Vol.1, Issue.1, pp. 22-32, 2014.
- [12] R. Hossain, M. Ahmed, M. Alfasani, and H. Zaman, "An Advanced Security System Integrated With RFID Based Automated Toll Collection System of Third Asian Conference on Defence Technology (3rd ACDT), 978-1-5090-4791-8/17/\$31.00 ©2017 IEEE, 2017.
- [13] B. Chowdhury, and R. Khosla, "RFID-based Hospital Real-time Patient Management System", In the Proceedings of the 6th IEEE/ACIS International Conference on Computer and Information Science (ICIS 2007), 2007.
- [14] F. Liu, and Z. Miao, "The Application of RFID Technology in Production Control in the Discrete Manufacturing Industry", In the Proceedings of the IEEE International Conference on Video and Signal Based Surveillance (AVSS'06), 2006.
- [15] M. Li, and Y. Xiao, "RFID-based Tracking and Tracing Information Platform of Logistics", In the Proceedings of the 2013 IEEE International Conference on Anthology, 978-1-4799-1660-3, 2013.

A brief optimization of correlated SQL queries

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Abstract—Efficient evaluation of correlated sub queries in large systems received much attention by researches as it became crucial issue. Correlated SQL subqueries, in a relational database management system (RDBMS) can be efficiently evaluated by decor relating them, by taking care of SQL count bug and avoid using of outer join operation which is very expensive. RDBMS query processor returns a tuple of null(s) from a scalar derived table when there is no tuple match found from a correlated subquery. It then uses COALESCE function which generates proper count value of zero from the null and maintains correlation level one. The query processor also performs a “pass-through” optimization instead of a join operation to improve efficiency.

Keywords— Correlated SQL Subqueries, Outer Join, Optimization

Key References -

- [1] Michelle M. Jou, Ting Yu Leung, Mir Hamid Pirahesh, "Optimization of correlated SQL queries in a relational database management", United States Patent, Patent No. 5,822,750, Date of Patent: Oct. 13, 1998
- [2] Hamid Pirahesh, Joseph M. Hellerstein, Waqar Hasant, "Ex ensible/Rule Based Query Rewrite Optimization in Starburst", Proceedings of ACM SIGMOD '92 International Conference on Management of Data, San Diego, Calif., U.S.A., Volume 21, Issue 2, pp 39-48, 1992.
- [3] Praveen Seshadri, Hamid Pirahesh, T.Y. Cliff Leung, "Complex Query Decorrelation", In the Proceedings of the 1996 IEEE International Conference on Data Engineering, USA, pp 450 - 458, 1996.
- [4] Anant D. Jhingran, Lubor J. Kollar, Timothy R. Malkemus, Sriram K. Padmanabhan, "Method for localizing execution of subqueries and determining collocation of excution of subqueries in Parallel Database", United States Patent, Patent No. US5745746 A, Date of Patent: Apr 28, 1998
- [5] [5] Patricia A. Dwyer, "Automated query optimization method using both global and parallel local optimizations for materialization access planning for distributed databases", United States Patent, Patent No. 4,769,772 , Date of Patent: Sep. 6, 1988
- [6] Buwen Wu, Yongluan Zhou, Hai Jin, Amol Deshpande, "Parallel SPARQL Query Optimization", In the Proceedings of the 2017 IEEE International Conference on Data Engineering(ICDE), USA, pp 547 -558, 2017.
- [7] T Cruanes, B Dagevile, B Ghosh, "Parallel SQL execution in Oracle 10g", In the proceeding of ACM, pp 850 – 854, 2004

- [8] P Beame, P Koutris, D Suciu , "Communication Steps for Parallel Query Processing", Journal of the ACM (JACM), Volume 64 Issue 6, Article No. 40
- [9] TY Leung, MH Pirahesh, P Seshadri, "System for optimizing correlated SQL queries in a relational database using magic decorrelation" , United States Patent, Patent No. 5,548,755, Date of Patent: Oct. Aug. 20, 1996

Vehicular Ad-hoc Network- A Brief Survey

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Abstract—Now-days Vehicular ad-hoc networks (VANET) become one of the promising components of the intelligent transportation systems (ITS). ITS help to enhance efficiency and traffic safety services to the stakeholders such as vehicle and drivers. The VANET is a special type of mobile ad-hoc networks in which vehicle acts as a mobile node. The VANET achieves vehicle to vehicle and vehicle to infrastructure communication through the dedicated short-range communication standards. The VANET is having challenges like a frequent change in the topology, complex city environments, dynamic behavior, unstable links and vehicle movement with constraints like the layout of the road and restricted movement pattern. Hence designing a routing protocol is difficult in the VANET. The objective is to study of the several routing protocols comprising pros, cons, route selection method and significance of Quality of Service. To perform experimentation and to represent the real view of the traffic in the vehicular network, a simulation tool and mobility models are used. This paper elaborates the several mobility models and simulation tools with their features.

Key References -

- [1] S. K. Bhoi and P. M. Khilar, "Vehicular communication: a survey," in IET Networks, vol. 3, no.3, pp. 204-217, September 2014.
- [2] Marzak B., Toumi H., Benlahmar E., Talea M., "Performance Analysis of Routing Protocols in Vehicular Ad Hoc Network", In El- (eds) Advances in Ubiquitous Networking 2. Lecture Notes in Electrical Engineering, vol 397. Springer, Singapore.
- [3] Rawal, Tejas. (2015). "Intelligent Transportation System in India - A Review", Journal of Development Management and Communication. 2. 299
- [4] F. Li and Y. Wang, "Routing in vehicular ad hoc networks: A survey," IEEE Vehicular Technology Magazine, vol. 2, no. 2, pp. 12-22, June 2007.
- [5] J. B. Kenney, "Dedicated Short-Range Communications (DSRC) Standards in the United States," In the Proceedings of the IEEE, vol. 99, no. 7, pp. 1162-1182, July 2011
- [6] N. Goel, G. Sharma and I. Dhyan, "A study of position based VANET routing protocols," 2016 International Conference on Computing, Communication and Automation (ICCCA), Noida, 2016, pp. 655-660

- [7] C. Cooper, D. Franklin, M. Ros, F. Safaei and M. Abolhasan, "A Comparative Survey of VANET Clustering Techniques," in IEEE Communications Surveys & Tutorials, vol. 19, no. 1, pp. 657-681, First quarter 2017.
- [8] L. D. Chou, J. Y. Yang, Ying-Cheng Hsieh and C. F. Tung, "Intersection-based routing protocol for VANET," 2010 Second International Conference on Ubiquitous and Future Networks (ICUFN), Jeju Island, Korea (South), 2010, pp. 268-272.
- [9] G. Li, L. Boukhatem and J. Wu, "Adaptive Quality-of-Service-Based Routing for Vehicular Ad Hoc Networks With Ant Colony Optimization," IEEE Transactions on Vehicular Technology, vol. 66, no. 4, pp. 3249-3264, April 2017.
- [10] M. Hashem Eiza, T. Owens and Q. Ni, "Secure and Robust Multi-Constrained QoS Aware Routing Algorithm for VANETs," in IEEE Transactions on Dependable and Secure Computing, vol. 13, no. 1, pp. 32-45, Jan.-Feb. 1 2016.
- [11] J. Harri, F. Filali, and C. Bonnet, "Mobility models for vehicular ad hoc networks: a survey and taxonomy," in IEEE Communications Surveys & Tutorials, vol. 11, no. 4, pp. 19-41, Fourth Quarter 2009.
- [12] S. A. Ben Mussa, M. Manaf, K. Z. Ghafoor and Z. Doukha, "Simulation tools for vehicular ad hoc networks: A comparison study and future perspectives," 2015 International Conference on Wireless Networks and Mobile Communications (WINCOM), Marrakech, 2015, pp. 1-8.
- [13] O. Tonguz, N. Wisitpongphan, F. Bait, P. Mudalige and V. Sadekart, "Broadcasting in VANET," 2007 Mobile Networking for Vehicular Environments, Anchorage, AK, 2007, pp. 7-12.
- [14] S. Allal and S. Boudjit, "Geocast Routing Protocols for VANETs: Survey and Guidelines," 2012 Sixth International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing, Palermo, 2012, pp. 323-328.
- [15] Martinez, F. J., Toh, C. K., Cano, J.-C., Calafate, C. T. and Manzoni, P. (2011), "A survey and comparative study of simulators for vehicular ad hoc networks (VANETs)". *Wirel. Commun. Mob. Comput.*, 11: 813–828

Online Social Network based Question Answer System

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Abstract—The System is important for exchanging the knowledge and information among the participants of the system. The participant is willing to know something, ask questions in the system and participant who are capable will give the response on the question. As population increases number of questioner and answerer are increase so it gain the chance to get answer with quality and within time. Searching the previously asked question reduces need to answer for same question again. Goal of this paper is to improve the performance and efficiency by forwarding the question to users who are interested to give the response as expected on the questions. The previously asked questions will saved in the repository. We illustrate the architecture and procedure to observe the performance with the participants present in the system.

Keywords— Knowledge and Information, Performance, Question answer system, Repository.

Key References -

- [1] Morris, J. Teevan, and K. Panovich. "A Comparison of Information Seeking Using Search Engines and Social Networks" In In Proc. of ICWSM, 2010.
- [2] M. R. Morris, J. Teevan, and K. Panovich. "What do People Ask Their Social Networks, and Why?: A Survey Study of Status Message Q&A Behavior". In Proc. of CHI, 2010.
- [3] L. A. Adamic, J. Zhang, E. Bakshy, and M. S. Ackerman. "Knowledge Sharing and Yahoo Answers: Everyone Knows Something". In Proc. of WWW, 2008.
- [4] M. Richardson and R. White. "Supporting Synchronous Social Q&A Throughout the Question Lifecycle". In Proc. of WWW, 2011.
- [5] R. W. White, M. Richardson, and Y Liu. "Effects of Community Size and Contact Rate in Synchronous SocialQ&A". In Proc. of SIGCHI, 2011.
- [6] J. Teevan, M.R. Morris, and K Panovich. "Factors Affecting Response Quantity, Quality, and Speed for Questions Asked via Social Network Status Messages". In Proc. of ICWSM, 2011.
- [7] Z. Li and H. Shen. "Collective Intelligence in the Online Social Network of Yahoo!Answers and Its Implications". In Proc. of CIKM, 2012.
- [8] X. Quan, W. Liu, and B. Qiu. "Term Weighting Schemes for Question Categorization". TPAMI, 2011.
- [9] B. M. Evans and E. H. Chi. "Towards a Model of Understanding Social Search". In Proc. of CSCW, 2008.

- [10] D. Horowitz and S. D. Kamvar. "The Anatomy of a Large-Scale Social Search Engine". In Proc. of WWW, 2010.
- [11] A. Shtok, G. Dror, Y. Maarek, and I. Szpektor. "Learning From the Past: Answering New Questions With Past Answers". In Proc. of WWW, 2012.

Response Generation Model for Chatbot using Neural Responding Machine

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Abstract—The issue of response generation in the various helpdesk systems or chatbots or conversational entities is addressed considering its multi-dimensional functioning in this paper. To deal with response generation basic encoder decoder model is suggested and its implementation and methodology is based on Recurrent Neural Network (RNN). The paper mainly focuses on implementation of response generation model on using Neural Responding Machine and its implementation with RNN.

Keywords— NRM, RNN, Encoder Decoder Model

Key References -

- [1] Jason D Williams and Steve Young. 2007. Partially observable markov decision processes for spoken dialog systems. *Computer Speech & Language*, 21(2):393–422
- [2] Jost Schatzmann, Karl Weilhammer, Matt Stuttle, and Steve Young. 2006. A survey of statistical user simulation techniques for reinforcement-learning of dialogue management strategies. *The knowledge engineering review*, 21(02):97–126.
- [3] -Michael Auli, Michel Galley, Chris Quirk, and Geoffrey Zweig. 2013. Joint language and translation modeling with recurrent neural networks. In EMNLP, pages 1044–1054.
- [4] Dzmitry Bahdanau, Kyunghyun Cho, and Yoshua Bengio. 2014. Neural machine translation by jointly learning to align and translate. *arXiv preprint arXiv:1409.0473*.
- [5] Kyunghyun Cho, Bart van Merriënboer, Caglar Gulcehre, Fethi Bougares, Holger Schwenk, and Yoshua Bengio. 2014. Learning phrase representations using rnn encoder-decoder for statistical machine translation. *arXiv preprint arXiv:1406.1078*.
- [6] Junyoung Chung, Caglar Gulcehre, KyungHyun Cho, and Yoshua Bengio. 2014. Empirical evaluation of gated recurrent neural networks on sequence modeling. *arXiv preprint arXiv:1412.3555*.
- [7] Nal Kalchbrenner and Phil Blunsom. 2013. Recurrent continuous translation models. In EMNLP, pages 1700–1709.
- [8] Alex Graves. 2013. Generating sequences with recurrent neural networks. *preprint arXiv:1308.0850*.

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At Walchand College of Engineering (WCE) Sangli, Computer Science and Engineering (CSE) Department as well as Information Technology (IT) Department, under Association for Computing Machinery (ACM) India, are active in promoting research in advances in computer science and engineering; so also in information technology. This has resulted into instituting WCE-ACM chapter. The first 2 days national research symposium was organized during Dec 19-20, 2016 at WCE and it received excellent response from researchers. In this series, the WCE-ACM chapter is delighted to announce its Second National Research Symposium on Computing 2017 (RSC 2017) in Dec 2017 under the technical support from ACM. The WCE-ACM chapter welcomes research paper submissions from faculty, doctoral students, research scholars and industry experts who are actively working in the area of Computer Science and Engineering and allied branches.

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