International Journal of Inventive Engineering and Sciences

ISSN : 2319- 9598
Website: www.ijies.org
Volume-4 Issue-5, March 2017
Published by:
Blue Eyes Intelligence Engineering and Sciences Publication Pvt.

Dr. Pavol Tanuska
Associate Professor, Department of Applied Informetics, Automation, and Mathematics, Trnava, Slovakia

Dr. VS Giridhar Akula
Professor, Avanthi's Research & Technological Academy, Gunthapally, Hyderabad, Andhra Pradesh, India

Managing Chair

Mr. Jitendra Kumar Sen
International Journal of Inventive Engineering and Sciences (IJIES)

Reviewer Chair

Dr. R.Balamurugan
Professor, Department of Electrical and Electronics Engineering, KSR College of Technology,Tiruchengode Tamilnadu, India

Dr. Ganesh Kumar T
Department of Computer Science and Engineering, Research Scholar, Manonmaniam Sundaranar University,Tirunelveli, India

Dr. K.Siva Rama Krishna
Assoc. Professor, Department of Civil Engineering, Gitam University Visakhapatnam, India

Dr. P.Sanjeevikumar
Assoc. Professor, Department of Electrical Engineering, Bharathi Street, Jeevanandhapuram, Lawspet, Puducherry, India

Dr. DALAH Mohamed
Professor, Department of Mathematics, Faculty of Sciences, University of Constantine 1 / Algeria

Dr. Shoukat Ali
Professor, Department of Mathematics Govt. Engineering College Bikaner Karni Industrial Area, Pugal Road,Bikaner-334004 Rajasthan State, India

Dr. Vijay K Chaudhari
Professor & Head, Department of Information Technology, Truba Institute of Engineering and Technology, Bhopal (M.P.), India

Dr. Ricardo Rodriguez Jorge
Associate Professor, Technological University of Ciudad Juarez

Dr. N. Venkatesan
Assoc. Professor in Department of IT, Bharathiyar College of Engg & Tech, Karaikal

Dr. Syed umar
Assoc. Professor Department of ECM, KL University,Green Fields, Vaddeswaram, Guntur District, (A.P.), India

Dr. Manoranjan Pradhan
Professor, Department of Computer Science and Engineering, Gandhi Institute for Technological Advancement(GITA), At Badaraghunathpur, Odisha, India

Dr. H.S. Behera
Assoc. Professor, Department of Computer Science and Engineering, Veer Surendra Sai University of Technology (VSSUT) Burla, Sambalpur, Odisha, India

Dr. Sunil Kumar
Assoc. Professor, Department of Mathematics, National Institute of Technology, Jharkhand, India

Dr. Shrikant Tiwari
Assoc. Professor, Department of Computer Science & Engineering, Shri Shankaracharya Group of Institutions, Chattisgarh, India

Dr. Ahmed AbdAllah Hassan
Assoc. Professor, Department of Computer Science and Informatics,community college, Taibah university, Al Medina Al Munawara, Saud Arabia

Dr. Vijay H Mankar
Associate Professor, Department of Electronics and Telecommunication, Govt. Poly Technique, Nagpur (Maharastra), India

Dr. Govindaraj Thangavel
Professor & Head, Department of EEE, Muthayammal Engineering College, Rasipuram, Namakkal, Tamilnadu, India

S. No	Volume-4 Issue-5, March 2017, ISSN: 2319-9598 (Online) Published By: Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd.	Page No.

1.

Authors: Vinod S. Bhaskarwar

Paper Title: Need and Reasons for the Development of Performance Measures and Evaluation for the Relm of Environment Management in Indian Industries

Abstract: Environmental management is management of those activities of a firm that have or can have an impact on the environment. The manufacture of products involves extracting raw materials from the environment and processing them to produce saleable items. As a result of the production process, various forms of waste (solid, liquid and gaseous) enter the environment. The activities surrounding the manufacturing process - such as maintenance of plant and infrastructure and the packaging and transport of goods all have environmental impacts. In addition, the products that are produced will eventually be disposed of and enter the environment as waste simply the environment acts as a source of raw material inputs to the industrial process and as a sink for its waste outputs. This relationship between Environmental management means different things to different people. Generally the focus is on environmental impacts and ways they can be minimized. The scope of the activities, resources or area that we aim to improve environmentally varies considerably

Keywords: Environmental Management System, critical Factors, performance Measures

References:

1. Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). "An empirical examination of the relationship between corporate social responsibility and profitability", Academy of Management Journal, Vol-28, pp 446-463.
2. Alberti, M., Caini, L., Calabrese, A. and Rossi, D. (2000). "Evaluation of the costs and benefits of an environmental management system", International Journal of Production Research. Vol- 38(17), pp 4455-4466.
3. Argyris, C. (1998), "Empowerment: the emperor's new clothes", Harvard Business Review, pp.98-105.
4. Atwater, D.C., Bass, B. (1994), "Transformational leadership in teams", B.M. Avolio, B .J. Edward, Improving Organizational Effectiveness through Transformational Leadership, Sage Publication, London, pp.48-83.
5. Anderson, J. C., Cleveland, G., & Schroeder, R. G. (1989). "Operations strategy: A literature review", Journal of Operations Management, Vol-8, pp 133-158.
6. Arthur D. Little. (1989). "State-of-the-art environment, health and safety management programs", Cambridge, MA: Arthur D. Little, Inc., and Center for Environmental Assurance.
7. Aragon-Correa, J. A. (1998). "Strategic proactivity and firm approach to the natural environment", Academy of Management Journal, Vol-41, pp 556-567.
8. Badri, M.D. and Davis, D. (1995), "A study of measuring the critical factors of quality Management", International Journal of Quality & Reliability Management, Vol- 12, No. 2, pp. 36-53.
9. Belkaoui A, Karpik P.G. (1989). "Determinants of the Corporate Decision to Disclose Social Information", Accounting, Auditing, and Accountability Journal Vol-2(1), pp 36–51.
10. Business: Championing the Global Environment, Conference Board Report Number 995 (New York, NY: The Conference Board, 1992).
11. Berry, M. and Rondinelli, D. (1998), "Proactive corporate environmental management: a new industrial revolution", Academy of Management Executive, Vol. 12 No. 2, pp. 38-50.

1-3

2.

Authors: Awatif M.A.Elsiddieg

Paper Title: Stability and Efficiency of the Positive Definite Quadratic Programming Algorithms

Abstract: In this paper we introduce some stable and efficiency algorithms for the positive definite quadratic programming. Sections (1), introduce matrix factorizations QR factorization ,orthogonal transformation using Householder matrices , which leads to our main work. In section(2) general consideration is given. In section (3) we introduce the basic concepts methods linear equality and inequality constraints that leads to our methods. In section (4) we give some of the stable and efficiency algorithms for positive quadratic programming only using KKT-conditions. We conclude our paper by showing that there are stable and efficient methods for indefinite programming as the extended Dantzig Wolfe method[20].

Keywords: KKT-conditions, QR factorization, active set methods, penalty and barrier functions, complementrity.

References:

1. Alkhayyal. A. F. (1987) An implicit Enumeration Procedure. For The General Linear Complementary problem .Mathematical programming Study, 31:1-20.
2. Bazaraa, Shetty and Sherali, (1994). Nonlinear Programming: Theory and Application Wiley.
3. Bunday Brian (1984) Basic optimization Methods. Edward Arnold.
4. Burdet G. A. (1971) General quadratic programming. Carriage-Mellon University. Paper W, p. 4 – 71 -2.
5. Coleman and Li,Large Scale (1990). Numerical Optimization. SIAM Books.
6. Cottle. R.W.(1990).The Principle Pivoting method positive visited math program 48, 369-385..
7. Bertsekas D.P. (1991),Linear Network Optimization: Algorithms and codes MIT Press Cambridge, M .A.
8. David G. Luenberger (2003) Linear and nonlinear programming 2nd Edition. Pearson Education, Inc. Publishing as Addison-Wesley.
9. Dennis and Schnabel (1996) Numerical Methods for unconstrained Optimization and nonlinear equation classics in applied Mathematics. SIAM.
10. Fletcher R. (1987) Practical Methods of Optimization, 2nd Ed. John Wiley and Sons.
11. Gill. P. E. and Murray. W. (1975) Numerical Methods for constrained optimization (Eds. P. E. Gill and W. Murray), Academic press, London.
12. Gill. P. E. and Murray. W. (1978) Numerically Stable methods for quadratic programming. Math Prog 14, 349 - 372.
13. Gill. P. E. and Murray. W. (1988) Practical Optimization. Academic Press.
14. Golub G. H. and Van Loan. C. F. (1983) Matrix computations, the John Hofkin University Press.
15. Dennis J. E. and R.B.Schnabel (1983). Numerical Methods for Unconstrained Optimization and Nonlinear Equations,Prentice Hall, Englewood Cliffs,NJ.
16. Kendall, E. (1978). An introduction To Numerical Analysis. John Wiley & Sons.
17. Kunisch K, Rendl F. (2003).An infeasible active set method for quadratic problems with simple bounds.siam journal on optimization volume

4-26

14,number1 pp35-52.
18. Karmarkar's (1991).Linear programming algorithm and Newton's method.Mathematical programming 50.291-330.
19. Keller.E.L.(1973).The general quadratic optimization problem. Math. Prog. 3, 311-337.
20. Mohsin H. A. Hashim (1996) An Extension to the Dantzig-Wolfe Method for general quadratic programming Ph.D. thesis, University of Khartoum.
21. M.M . Khader,N.H .Sweilam &A. M.S.Mahdy (2011). An Efficient Numerical Method for Solving the Fractional Diffusion Equation .
22. Byrd R. H, Gillbert J., C., and. Nocedal.J.(2000) A trust region method based on interior point techniques for nonlinear programming, 9, pp. 149 - 185.
23. Boyd .S. and. Vandenberghe .L..(2003). Convex Optimization. Cambridge University.
24. Jorge Nocedal and Stephen Wright books (2006) Springer Series in Operations Research and Financial Engineering. Springer.
25. Stephen G. Nash and Ariela Sofer (1996) . Linear and non -liner programming, McGraw Hill, New York.
26. Stephen G. Nash and Ariela Sofer (2008) . Linear and non -liner programming, McGraw Hill, New York

3.

Authors: **Anil Kumar Tiwari, G. Ramakrishna, Lokesh Kumar Sharma, Sunil Kumar Kashyap**

Paper Title: **Big Data Management by Fuzzy, Neural Network and Genetic Algorithm**

Abstract: This paper manages the academic data by the dynamic techniques. The data may have the infinite information. This infinite information transforms into the finite information by the dynamic algorithm. This dynamic algorithm consists fuzzy logic, neural and genetic algorithm. Thus the result lies the data analysis from Data Mining to Dynamic Data Mining. New techniques are introduced here for redefining the database and its analysis. The database Student's Academic Performances is selected for the generalization of the proposed method. It is all is studied over Fuzzy, Neural Network and Genetic Algorithm.

Keywords: Data Mining (DM), Dynamic Data Mining (DDM), Database (DB), Student's Academic Performance (SAP), Neural Network (NN), Genetic Algorithm (GA).

27-28

References:

1. Lee C. C., Fuzzy logic in control systems: Fuzzy logic controller-Part I & II, IEEE Trans. Syst., Man, Cybern, SMC 20, 2, 1990, 404-435.
2. Li Y. F., Lan C. C., Development of fuzzy algorithms for servo systems, IEEE cont. sys. mag., 1989, 65-72.
3. Self K. L., Fuzzy logic design, IEEE spectrum,27, 1990, 42-44.
4. Scharf E. M., Mandic N. J., The application of a fuzzy controller to the control of a multi-degree-freedom robot arm, in industrial application of fuzzy control, M. Sugeno Ed. Amsterdam: North-Holand, 1985, 41-62.
5. Shao S., Fuzzy self-organizing controller and its application for dynamic processes, Fuzzy sets systems, 26, 1988, 151-164.
6. Tanscheit R., Schraf E. M., Experiments with the use of a rule based self-organizing controller for robotics applications, fuzzy sets systems, 26, 1988, 195-214.
7. Zadeh L. A., Fuzzy Sets, Information and control, 8, 1965, 338-353.
8. Zadeh L. A., Fuzzy Logic, IEEE Computer Magazine, 1988, 83-93.

4.

Authors: **T. Subrahmanyam, G. Sai Karthik, N. Sai Sudheer, S. Farooq Basha, Ch. Sridhar Yesaswi**

Paper Title: **Analysis of a Modelled CNC Milling Machine Bed with different Composite Materials**

Abstract: In Industrial world CNC machines are dominating because of its versatile form of automation. The structural materials used in a machine tool plays a decisive role in productivity, accuracy and surface finish of the parts manufactured in it. The materials which have high stiffness and good damping characteristics are only used as structural materials in machine tool to withstand high operating speeds. The vibrations developed in machining operation gets transferred into machine tool structure. The conventional structural materials such as cast iron and steel develops positional errors due to vibrations transferred into the structure at high operating speeds. We know that by experiences, the proportionality of the life of a machine is inverse to the levels of vibrations that the machine is subjected. In this work, a machine bed is selected for the analysis on static loads. Then work is carried out to overcome the limitations in structural material, conventional materials are replaced with composite materials having high stiffness and good damping characteristics. The main aim of this work is increasing and reducing the structural weight. A 3D CAD model of the machine bed is created by using SOLID WORKS and analysis were carried out on different composite machine bed using ANSYS workbench.

Keywords: Machine tool, Machine bed, Stiffness, Damping, Solidworks, Ansys.

29-32

References:

1. S. Kalpakjan, Manufacturing Engineering and Technology, 3rd Edition, Addison-Wesley, Reading, MA, 1995.
2. A.Selvakumar, P.V. Mohanram, "Analysis of alternative composite material for high speed precision machine tool structures" International journal of Engineering, 2, pp.95-98, 2012
3. S. Syath Abuthakeer, P.V. Mohanram, G. Mohan kumar, "Structural redesigning of a CNC lathe bed to improve its static and dynamic characteristics", International journal of Engineering, 2, pp.389-394, 2011.
4. Anil Antony Sequeira, "Modified Approach for Cutting Force Measurement for Face in Milling", Innovative Systems Design and Engineering, 4, 2012.
5. Damping characteristics of composite hybrid spindle covers for high speed machine tools Jung Do Suha, Seung Hwan Changa, Dai Gil Leea, Jin Kyung Choib and Bo Seon Parkc , Journal of Materials Processing Technology, Volume 113, Issues 1-3, 15 June (2001), Pages 178-183.
6. Srikanth thesis on composites for machine tool beds journal in production engineering 2011.
7. The Machine Tool Industry Research Association, A Dynamic Performance Test for Lathes, July, 1-86, (1971).

5.

Authors: **Aman Kumar, Gurinder Pal Singh**

Paper Title: **Low Power Current Mirror Topologies in 32nm Technology for VlSI Analog Circuit**

Abstract: This paper deals with the analog circuit constructed using a current mirror. Two stage op-amp circuits are made from current mirror and other elements like source amplifier. Here, we have constructed four types of current mirror named as Conventional CM, Cascode CM, Wilson CM, modified Wilson CM. The imperative constraints of current mirrors approaches are source voltage for small power, output resistance, overall power, constancy are related to each other. On studying these schemes, it is detected that modified Wilson current mirror current mirror system has

33-38

increased the output resistance by 21MΩ to 37MΩ of the Wilson current mirror and decreased the power consumption by 23.10µW to 19.43µW.We have also constructed two-stage op-amps with help of conventional current mirror. In this paper an operational amplifier by CMOS is presented whose input depends on bias current which is 20uA and designed using 32nm technology. In sub-threshold region due to unique behavior of the MOSFET transistors not only allows a designer to work at low voltage and also at low input bias current. Scaling of MOSFET and keeping Vdd up to 0.8V-1.2V gain and phase margin of purposed op-amp has been obtained 78.6db and 68.8o respectively. These simulations are accomplished in 32nm CMOS technology using Galaxy cdesigner tool in Synopsis.

Keywords: Mixed design, CMOS, Two Stage op-amp, Current Mirrors, Synopsis, diode connected, MOSFET, Low voltage.

References:

1. A.S.Sedra, K.C.Smith, "Microelectronic circuits theory and applications", Oxford, New york 2009, Pp.587–684.
2. P.E.Allen, D.R.Holberg,"CMOS analog circuit design", Oxford, South Asia Third Edition, Pp.128-146.
3. S. S. Rajput and S. S. Lamar, "A high-performance current mirror for low voltage designs", IEEE, Tiwjin, China, pp. 170-173, Dec 2000.
4. Sackinger, E., & Guggerruhi, W. (1990),"A high-swing, high impedance MOS cascode circuit", IEEE Journal of Solid State Circuits, 25(1), 289–298.
5. Serrano, T., & Linares-Barranco, B. (1994). "The active-input regulated cascode current-mirror", IEEE Transactions on Circuits and Systems Part I, 41(6), 464–467.
6. B.Razavi,"Design of analog CMOS integrated circuits", McGrraw-Hill, New Delhi (India) 2002, pp.135-145.
7. Sackinger, E., & Guggerruhi, W. (1990),"A high-swing, high impedance MOS cascode circuit", IEEE Journal of Solid State Circuits, 25(1), 289–298.
8. Erik Bruun and Peter Shah "Dynamic Range of Low-Voltage Cascode Current Mirrors" 0-7803-25'70-2195 $4.00 @1995 IEEE
9. R. Jecob Baker, Harry W. Li, David E. Boyce, "CMOS Circuit Design, Layout and Simulation", IEEE Press Series on Microelectronic Systems, 1997, pp.613-651.
10. Siddhartha, Mehul, Aditya Gahlaut, "Comparative study of CMOS op-amp in 45nm and 180 nm technology", Journal of Engineering Research and Applications, Vol. 4, Issue 7(Version 1), July 2014.
11. Hitesh and Anuj Goyal "Performance parameters of improved swing, wilson and regulated cascode current mirrors", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 2, Issue 3, March 2012.
12. BhawnaAggarwal, Maneeshav Gupta, A.K.Gupta "A comparative study of various current mirror configurations: Topologies and characteristics", Microelectronics Journal 53(2016)134–155,2016.
13. SayanBandyopadhyay Deep Mukherjee, Rajdeep Chatterjee," Design Of Two Stage CMOS Operational Amplifier in 180nm Technology With Low Power and High CMRR", Int. J. of Recent Trends in Engineering & Technology, Vol. 11, June 2014.

6.

Authors:	**Rosy Dhiman, Akshay Rana, Mamta Arora**
Paper Title:	**Performance Analysis of OFDM System through Pseudo-Pilot and Greedy Algorithms**

Abstract: In this paper, to investigate a pilot problem for Greedy algorithms using channel estimation in OFDM system. The Greedy algorithm is used for channel estimation in OFDM system over AWGN fading channel. Thus, Greedy algorithm is used for the optimization process. The OFDM is providing a high speed data rate and low complexity because it reduces the intersymbol interference for transmission over frequency selective channel. Hence, Greedy algorithms use a pilot to create overhead problem, this problem solve with pseudo-pilot. On the basis of BER (bit error rate) performance of OFDM is evaluate. In Simulation results show, BER vs SNR compared the performance of pilot aided and pseudo-pilot using Greedy algorithms.

Keywords: Greedy Algorithms, Channel Estimation, OFDM System, Sparse Channel.

References:

1. Seyyed Hadi. "A Greedy Deterministic Pilot Pattern Algorithms for OFDM Sparse Channel Estimation" Springer, 2015.
2. C. Qi "Optimized a pilot placement for sparse channel estimation in OFDM systems" IEEE.18,no.12, pp. 749–752, Dec. 2011.
3. Chen "An efficient pilot design scheme for sparse channel estimation in OFDM system" IEEE, 2013.
4. C. Qi and L. Wu," A study of deterministic pilot allocation for sparse channel estimation in OFDM systems," IEEE Commun. Lett. vol. 16, no. 5, pp. 742–744, May 2012.
5. C. Carbonelli "Sparse channel estimation with zero tab detection" IEEE Trans. Wireless Commun., vol. 6, no. 5, pp. 1743–1753, May 2007.
6. Jan-Jaap Van De Beek "On channel estimation in OFDM systems" IEEE, volume 2, pages 715-719, Rosemont, IL, July 1995.
7. MATHAI "COMPARISON AND ANALYSIS OF CHANNEL ESTIMATION ALGORITHMS IN OFDM SYSTEMS", IJOSTR, VOL. 2, NO. 3, PP. 76- 80, 2013.
8. Hieh, "channel Estimation for OFDM systems based on Comb-Type arrangemnet in frequency selective fading channels" IEEE. 1998.
9. S. Coleri "Channel estimation techniques based on pilot arrangement in OFDM systems" IEEE. 48(3), 223–229 (2002).
10. Tropp "Greed is good: algorithmic results for sparse approximation", Information Theory, IEEE, vol.50, no.10, pp. 2231- 2242, Oct. 2004.
11. Yuping Zhao "A Novel Channel Estimation Method for OFDM Mobile Communication Systems Based on Pilot Signals and Transform-Domain Processing" IEEE TRANSACTIONS BROADCASTING, 0-7803-3659-3/97 19 97 IEEE.

39-42

7.

Authors:	**Akshay Rana, Rosy Dhiman, Mamta Arora**
Paper Title:	**Based on Pseudo-Pilot Channel Estimation Performance Analysis of OFDM System**

Abstract: The demand of Orthogonal Frequency Division Multiplexing (OFDM) has been increased from last few decades in wireless communication system. Channel estimation is the essential problem in OFDM system. Channel response can be obtained by employing pilot in payload symbols. In this paper we are estimating channel in OFDM system using pseudo-pilot inplace of pilot symbol. We are showing that the performance of proposed method is AWGN fading channel is better then the performance of pseudo-pilot in Rayleigh channel. In OFDM technique we are using time domain so signal in the series so we cannot used more signal it can use proposed channel estimation to estimate the channel impulse response using pseudo-pilot. The modulation technique used is QAM.

Keywords: Channel estimation, Orthogonal frequency division multiplexing (OFDM), Pseudo-Pilot, interlesver, MIMO

43-47

References:

1. S. Sharma and S. Kumar, "BER Performance Evaluation of FFT-OFDM and DWT-OFDM," International Journal of Network and Mobile Technologies, vol. 2, pp. 110-116, 2011.
2. Ghaith, R. Hatoum, H. Mrad, and A. Alaeddine, "Performance analysis of the Wavelet-OFDM new scheme in AWGN channel," in Communications and Information Technology (ICCIT), 2013 Third International Conference on, 2013, pp. 225-229.
3. Kiani and S. Mousavi, "Performance Assessment of DFT-OFDM and DWT-OFDM Systems in the Presence of the SSPA and Fading Channel."
4. M. Oltean and M. Nafornita, "Wavelet OFDM performance in frequency selective fading channels," in IEEE 8th Int. Conf. on Communications (COMM), 2010, pp. 343-346.
5. H. J. Taha and M. Salleh, "Performance analysis of QAM-modulation parameters on wavelet packet transform (WPT) and FFT-OFDM system," in Communications (MICC), 2009 IEEE 9th Malaysia International Conference on, 2009, pp. 1-5.
6. M. Oltean, "Wavelet OFDM performance in flat fading channels," Scientific Bulletin of University Politehnica Timisoara, ETC Series, vol. 52, pp. 167-172, 2007.
7. M. K. Gupta and S. Tiwari, "Performance evaluation of conventional and wavelet based OFDM system," AEU-International Journal of Electronics and Communications, vol. 67, pp. 348-354, 2013.
8. H.-G. Jeon, H.-K. Song, and E. Serpedin, "Walsh coded training signalaided time domain channel estimation for MIMO-OFDM systems,"Communications, IEEE Transactions on, vol. 56, pp. 1430-1433, 2008.
9. D. Imamura, K. I. H. Sudo, and G. Ohta, "A study of adaptive channel estimation for MMAC/OFDM systems," presented at the Proc. IEICE Gen. Conf., March 2000.
10. R. Funada, H. Harada, Y. Kamio, and S. Shinoda, "A channel estimation method for a highly mobile OFDM wireless access system," IEICE transactions on communications, vol. 88, pp. 282-291, 2005.
11. Orthogonal Frequency Division Multiplexing, U.S. Patent No. 3, 488,4555, filed November 14, 1966, issued Jan. 6, 1970.
12. S. Weinstein and P. Ebert, "Data transmission by frequency-division multiplexing using the discrete Fourier transform," IEEE Trans. on Communications., vol. 19, pp. 628--634, Oct. 1971
13. R.W. Chang, and R.A. Gibby [1968], “Theoretical Study of Performance of an Orthogonal Multiplexing Data Transmission Scheme,” IEEE Transactions on Communications, 16, 4, pp. 529-540.
14. Hirosaki. An Orthogonally Multiplexed QAM System Using the Discrete Fourier Transform. IEEE Trans. on Commun., 29(7):982-989, July 1981.
15. H.Kim, \Turbo coded orthogonal frequency division multiplexing for digital audio broadcasting," in 2000 IEEE Intern. Conf. on Commun., vol. 1, pp. 420-424.
16. Datacomm research company St. Louis, missouri USA,“Using MIMO-OFDM Technology To Boost Wireless LAN Performance Today”, White paper , June 2005.
17. Kamran Arshad, “Channel Estimation In OFDM Systems ”,MS thesis , Department Of Electrical Engineering , King Fahd University Of Petroleum And Minerals, Dhahran , Saudi Arabia ,August 2002
18. Edfors, O., Sandell, M., Wilson, S. K., & Borjesson, P. O. (1998). OFDM channel estimation by singular value decomposition. IEEE Transactions of Communications, 46, 931–939.
19. Y. Ma, “Pseudo-Pilot: A novel paradigm of channel estimation”, IEEE signal processing letters, vol. 23, NO. 6, june 2016.
20. J-J van de Beek, O.Edfors, M. Sandell, S.K Wilson and P.O. Borjession, On channel estimation in OFDM systems, in Proc.IEEE 45th Vehicular Technology Conference, Chicago,IL, Jul.1995, pp.815-819.
21. O.Edfors, M. Sandell, J.-J. van de Beek, S. K. Wilson and P. 0. Borjesson, “OFDM channel estimation by singular value decomposition,” in Proc. IEEE 46th Vehicular Technology Conference, Atlanta, GA, USA, Apr. 1996, pp. 923-927
22. Knhk Y. Qi et al., “On the physical layer design for low cost machine type communicationin 3GPP LTE,” in Proc. Veh. Technol. Conf. (VTC–Fall’14),Vancouver, BC, Canada, Sep.2014,pp.1-5