

## About the Authors



Prof. Dr. Syed Khasim, working as a Professor in Department of Computer Science & Engineering at Dr. Samuel George Institute of Engineering & Technology (SGIT), Markapur, Prakasam District, Andhra Pradesh. He received his Doctorate degree from Rayalaseema University, Kurnool, Andhra Pradesh, India. He has more than 18 years of teaching experience and 10 years of research experience. He published various research publications in reputed journals which are indexed by Google Scholar, SCOPUS, SCI & Springer. He has also registered and published National and International Patents. He has professional memberships of MIAENG, MIACSIT, MCSTA, MICSSITE, MUACEE, MIAOF, MISOC, MIAEST, MIASTED. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine Learning.



Dayaneshwar M. Baykar Earned his Master of Engineering in Computer Engineering from University of Mumbai, and Bachelor of Engineering Degree in Computer Science and Engineering from Dr. E.A.M.U., Aurangabad. He is currently working as an Assistant Professor in the Department of Computer Engineering, Terna Engineering College, Nerul, Navi Mumbai. He is having 13 years of Teaching Experience and 2 years of industrial experience. He has many publications in reputed International Journals and conferences. His Research Interests are Artificial Intelligence, Deep Learning, Natural Language Processing.



M.S. Antony Vigil Earned her Master's and Bachelor's Degree in Computer Science and Engineering from Anna University, Chennai. She is currently working as an Assistant Professor in the Department of Computer Science and Engineering, SRM Institute of Science and Technology, Ramapuram, Chennai. She is having 11 years of Teaching Experience. She has many publications in reputed International Journals and conferences which are indexed by Web of Science and Scopus. She has also registered Patents on IoT and Machine Learning. She has received "Young scientist Award" in the International Best Scientist Awards by VDP Good Professional Association. Her Research Interests are Image Processing, Artificial Intelligence, IoT and Cryptography.



Dr. B. Santhosh Kumar was born at Ooty, India on March 6, 1980. He completed B.E. in Computer Science and Engineering from Bharathiar University, Coimbatore, M.E. in Computer Science and Engineering from Anna University, Thiruchirappalli and completed Ph.D. in Information & Communication Engineering from Anna University, Chennai. He is having more than 16 years of experience and presently he is working as Professor in the Department of Computer Science & Engineering, Guru Nanak Institute of Technology, Hyderabad. His research interests include Data Science, Machine Learning, Blockchain Technology, Data Mining and Web Mining. He has more than 80 publications in a total of which are 35 journal publications, and 45 are conferences publications. He has delivered 15 guest lectures and keynote speeches on various occasions. He received 11 awards from various professional bodies. He is also serving as the reviewer for reputed journals globally like IEEE Transactions, IEEE Access, ACM Transactions, Complex & Intelligent Systems, Computer Communications, etc., and various international conferences organised by ASDF, IEEE and Springer. He is a Senior member of IEEE and ACM Distinguished Speaker.

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# ARTIFICIAL INTELLIGENCE

Author

Dr. Syed Khasim  
Dayaneshwar M. Baykar  
M.S. Antony Vigil  
Dr. B. Santhosh Kumar

# Computer Networks and Security

Dr. Shaik Shakeer Basha  
Dr. Syed Khasim

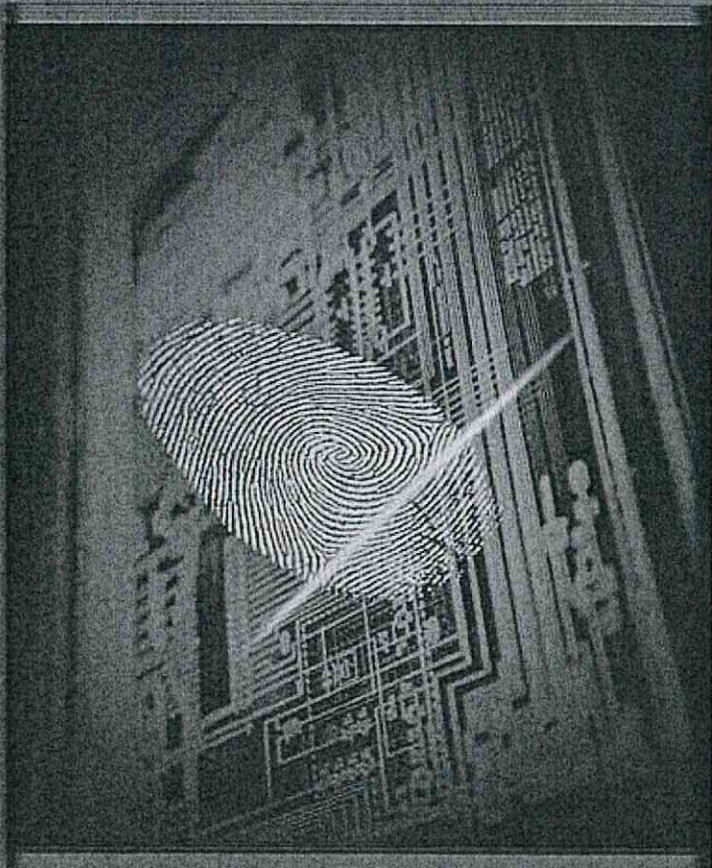
## About the Authors



Prof. Dr. Shaik Shakeer Basha working as a Professor in Department of Computer Science & Engineering at Avanthi Institute of Engineering & Technology, Near Ronoji Film City, Guntur, Hyderabad, Telangana. He received his Doctorate degree from Sanku University, Alwar, Rajasthan, India. He has more than 15 years of teaching experience and 10 years of research experience. He published various research publications in reputed journals which are indexed by Google Scholar, Scopus, SCI & Springer. He has also registered and published National and International Patents. He has Professional membership in IAENG. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine Learning.



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### About the Authors



Dr. Shaik Shaker Basha working as a Assoc. Professor in Department of Computer Science & Engineering at Avanti Institute of Engineering & Technology, Gunthapally, Hyderabad, Telangana. He received his Doctorate degree from Sun Rise University, Alwar, Rajasthan, India. He has more than 24 Years of teaching experience and 6 Years of research experience. He published various research publications in reputed journals which are indexed by Google Scholar, UGC Care & Web of Science. He has also Published Text books and refereed and published National and International Journals. He has Professional membership in IAREG. His research interests are Software Engineering, Artificial Intelligence, Cloud Computing and Machine Learning.



Dr. Md Ateeq Ur Rahman passed his Bachelor of Engineering degree from Galuriga Technological University in 2006. M.Tech degree with CSE as specialization from Vigneeswarya Technological University in 2008. He completed his Ph.D. from JNTUH University in 2015. He has experience of more than 39 years in Academics and Research. He joined SRECT in 2006 and has worked in different capacities as Assistant Professor, Associate Professor, Professor, Research Coordinator, Department Head, Visiting Head, Incharge, Vice Principal and Principal during this tenure. Till date, he has guided more than 200 UG and PG Computer Science & Engineering students. Presently he is guiding 5 Ph.D. research scholars of different universities. He designed the syllabus of M.Tech(Computer Networks) which was accepted and recommended by Board of Studies(BOS), JNTUH and implemented by the university for all the affiliated engineering colleges of University for the course of M.Tech(Computer Networks). He has published more than 100 research papers in National and International Journals and Conferences.



Prof. Dr. SYED KHASIM working as a Professor in Department of Computer Science & Engineering at Dr.Samuel George Institute of Engineering & Technology (SGIET), Markapur, Prakasam District, Andhra Pradesh, India. He received his Doctorate degree from Rayalaseema University, Kurnool, Andhra Pradesh, India. He has more than 49 years of teaching and research experience. He published various research publications in National and International journals (Springer, Elsevier, UGC-CARE list) which are indexing & Abstracted by Google Scholar, Thomson Reuters, WoS, Scopus and SCL. He has also registered and published Two National and Two International Patents. He has professional memberships of IEMSTE, MAJING, MIAEST, MIAEST, MIAEST, MIAEST, MIAEST, MIAEST, MIAEST, MIAEST. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics, Machine learning and Cloud Computing.

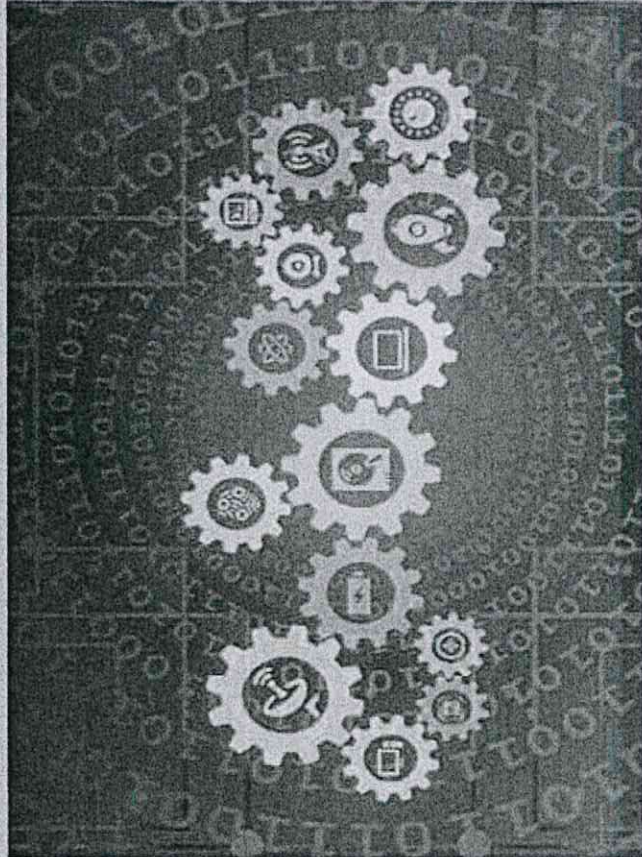
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# DATA SCIENCE

Dr. Shaik Shaker Basha  
Dr. Md Ateeq Ur Rahman  
Dr. Syed Khasim



# DATA SCIENCE

# CLOUD COMPUTING

## About the Authors



Dr. Shaik Shakeer Basha working as a Professor in Department of Computer Science & Engineering at Avadh Institute of Engineering & Technology, Near Binnoli Villor city, Cantt. Hyderabad, Telangana. He received his Doctorate degree from Saibaba University, Alwar, Rajasthan, India. He has more than 10 years of teaching experience and 10 years of research experience. He published various research publications in reputed journals which are indexed by Google Scholar, SCOPUS, ISI & Springer. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine Learning.



Dr. Syed Khasim, working as a Professor in Department of Computer Science & Engineering at Dr. Samuel George Institute of Engineering & Technology (SGIT), Malkajgiri, Prakasham District, Andhra Pradesh. He received his Doctorate degree from Jayalaxmi University, Karimol, Andhra Pradesh, India. He has more than 10 years of teaching experience and 10 years of research experience. He published various research publications in reputed journals which are indexed by Google Scholar, SCOPUS, ISI & Springer. He has also registered and published National and International Patents. He has professional memberships of "MIADMG", "MIACST", "MTCSSITE", "MDACB", "MIAOE", "MIBCC", "MIAEST". His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine Learning.



Dr. Sushma Jaiswal, received the B.Sc. (B.T) & (2000) in Computer Science from Devi Ahilya University, Indore, MCA (2002) and Ph.D. in Computer Applications from Rajasthan Technical University of Bhopal (M.P.). She is presently working as Assistant Professor in Department of Computer Science & Information Technology, Gera Ghobas Central University, Bilaspur (C.G.) and also worked as Assistant Professor in SOGS in Computer Sc. & IT, P. K. Kailashankar Shri Krishna University, Udaipur (U.C.). She has 10 years of experience in the teaching field. During this period, she has been involved in the undergraduate teaching, Post Graduate teaching, research activities, training and placement in charge and T.Q.A. activities etc. She has authored many papers, conference contributions and Books. Her research interests include: Image Processing, Computer Graphics, and She is the reviewer of several reputed journals. Her research interests include: Image Processing, Computer Graphics, and Machine Learning etc.

Authors:  
Dr. Shaik Shakeer Basha  
Dr. Syed Khasim  
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# PROGRAMMING IN PYTHON

## About the authors



Binny S pursuing her Ph.D in Computer Science and Engineering from Sathyabama Institute of Science and Technology. Completed her M.Tech in Computer Science at M.S. University, MCA from MAK University, PGDCA from Kerala University. She is having a 16 years of teaching experience. She published her articles in various reputed journals and she presented various papers in international conferences. She is having professional membership like IAENG, IOR, Received awards for Excellence in Research, Bharat education Excellence award from Yuva Acharya, Young research award. Her research areas are image processing, machine learning, deep learning, and medical image processing.



Dr. Murali Dhar M S is currently working for Vcd Tech Bangalore. Dr. Srimahala R&D Institute of Science and Technology, formerly known VcdTech Dr. RR & Dr. SR University as Assistant Professor in School of Computing, Department of Computer Science & Equipment. In 2020, he received the doctoral degree Doctor of Philosophy with specialization in Cloud Computing and Architecture from Anna University, Tamil Nadu. In 2009, he received his Master's degree, Master of Engineering, with specialization in Computer Science and Engineering from Anna University, Tamil Nadu, India. In 2006, he received bachelor's degree, Bachelor of Engineering from Anna University, Tamil Nadu, India, in Computer Science and Engineering. As an unwavering dedicated researcher, he has published 33 research papers in various reputed national and international journals. He takes a multidisciplinary approach that encompasses the fields of Cloud Computing, Data Analytics, Machine Learning, and Computational Intelligence. He has also registered National and International Patents in the areas of Data Storage in Mobile Cloud and Enhancing Network Performance in Wireless Sensor Networks.



S.Kalpana Devi, completed her Bachelor's in the Department of Computer Science and Engineering from Arulmigu Meenakshi Amman College of Engineering, Madras University and Master's at Dr.MGR Educational and Research Institute University. Currently working as Assistant Professor (Sr.G) in the Department of CSE, Eastard Engineering College, Ranapuram. She has 15 years of experience in teaching and published around 15 papers in the reputed journals and conferences. Her areas of interest include Design & Analysis of Algorithms, Networks, Data Analytics and Machine Learning.



Prof. Dr. Syed Khasim, Working as a Professor in Department of Computer Science & Engineering at Dr. Samuel George Institute of Engineering & Technology (SGIT), Markapur, Prakasam District, Andhra Pradesh. He received his Doctorate degree from Rayalaseema University, Kurnool, Andhra Pradesh, India. He has more than 15 years of teaching experience and 10 years of research experience. He published various research publications in reputed journals which are Indexed by Google Scholar, SCOPUS, SCI & Springer. He has also registered and published National and International Patents. He has professional memberships of IIAENG, MIACST, ACMSTA, MICSSITE, MAJACEL, MIAAD, MISOC, MIAEST, MIASTED. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine Learning.

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Authors:  
Mrs.S.Binny  
Dr.Murali Dhar M S  
Mrs.S.Kalpana Devi  
Dr.Syed Khasim

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# EDUCATION SYSTEM IN INDIA ISSUES, CHALLENGES AND PROBLEMS

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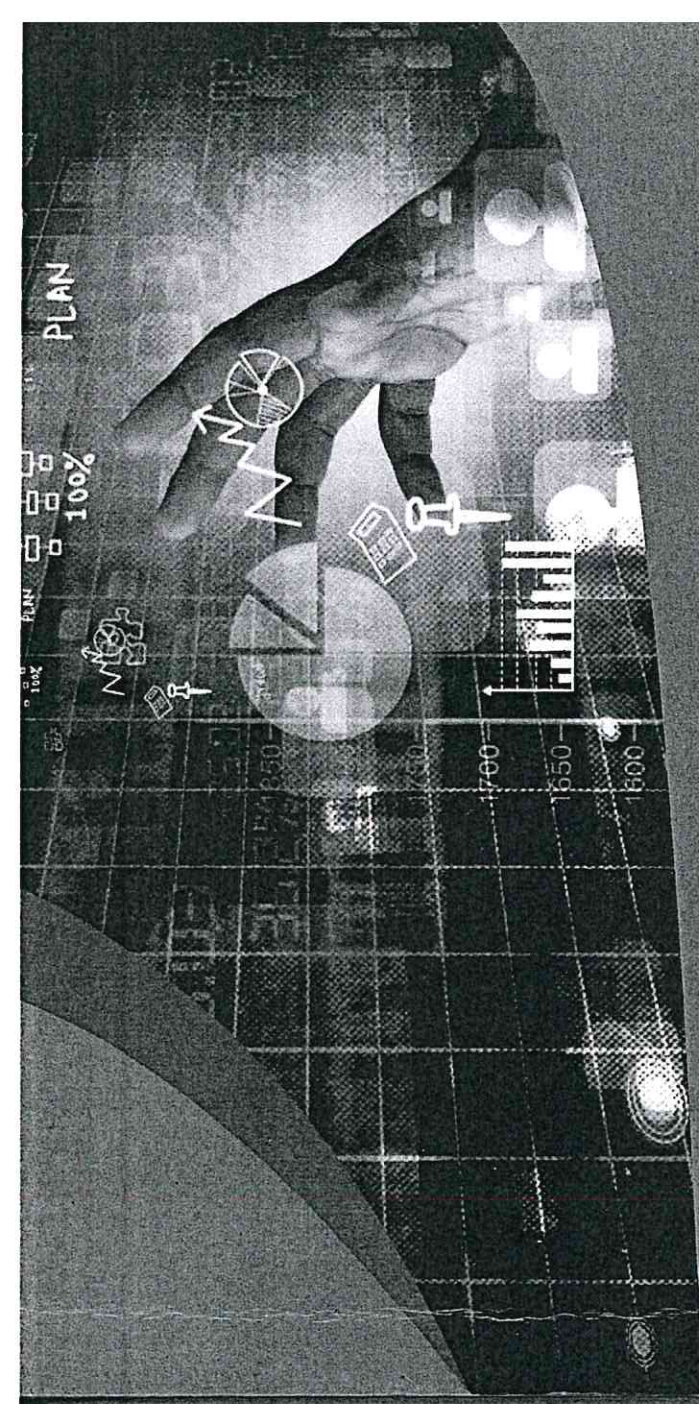
# DEEP LEARNING and its APPLICATIONS

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Deep Learning and its  
Applications

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# DATA SCIENCE

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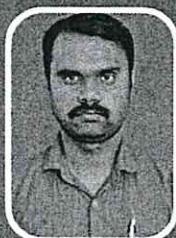
# ABOUT THE AUTHORS



**Dr.S. Venkataramana** is currently working as a Professor in the Department of Information Technology at Sagi Rama Krishnam Raju Engineering College, Chinnamiram, Bhimavaram, Andhra Pradesh, India. He has completion of B.Tech (C.S.E) from J.N.T.U. College of Engineering, Kakinada, and M.Tech (C.S.E) from J.N.T.U., Hyderabad. He has received Doctorate degree (Ph.D) from Department of CS&SE, Andhra University. He is a Reviewer and Editorial Board Member for various Scopus indexed international journals. He has published a total of 38 research papers in International Journals and 18 research papers in Conferences. He has published 4 Book Chapters, 4 papers in SCI (Web of Science) and 21 papers in Scopus indexed journals. He published 6 Indian Patents in the area of Computer Science. He has received Best Researcher Award-2020 by Elsevier SSRN and Research Excellence Award from Institute of Scholars during the year 2019-20.



**Mr.Sandeep Srivastava** currently working as Principal Engineer in software development company, Hughes Systique Corporation, Gurgaon, Haryana, India. He is pursuing Ph.D. in Computer Science from Galgotias University, Greater Noida. He has wide teaching and research experience. He has authored many research papers in International Conferences and Scopus-indexed journals of repute. He has 15 years of vast experience in technical training and administrative work in reputed Engineering Colleges/Universities and companies. He is also a resource person of Salesforce Technology. Mr. Srivastava has acquired MCA, M.Tech (CSE) degrees in the area of computer applications, IoT, Data warehouse and mining Data Science, C++ and wireless sensor networking.



**Dr. K. Jamberi** is currently working as an Assistant Professor in the Department of Computer Science at S.A College of Arts and Science, Thiruverkadu, Chennai. He has received Ph.D degree from the Alagappa university, Karaikudi. He has published 3 papers in Scopus, 4 papers in WoS, and 2 papers in UGC Care listed journals. He also published 8 papers in International, and 4 papers in national journals. His research interests include Data Science, Internet of Things, Machine Learning and Big Data.



**Dr. Syed Khasim** is currently working as a Professor in the Department of Computer Science and Engineering at Dr.Samuel George Institute of Engineering & Technology (SGIT), Markapur, Prakasam District, Andhra Pradesh, India. He received his Doctorate degree from Rayalaseema University, Kurnool, Andhra Pradesh, India. He has more than 18 years of teaching and research experience. He has published various research publications in National and International journals (Springer, Elsevier, IEEE Explore, UGC listed) which are indexing & Abstracting by Google Scholar, Thomson Reuters, ESCI, WoS, Scopus and SCI. He has also registered and published Two National and Two International Patents. He has professional memberships of MIAENG, MIACSIT, MCSTA, MICSSITE, MUACEE, MIAOE, MISOC, MIAEST, and MIASTED. His research interests are Software Engineering, Artificial Intelligence, Big Data Analytics and Machine learning.



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# Design And Simulation of CPW-fed Slot Antenna Using Metal-Insulator-Metal Plasmonic Waveguides

P.Osman<sup>1</sup>

<sup>1</sup>Department of Electronics and Communication Engineering Dept.  
Dr.Samuel George Institute of Engineering and Technology, Markapur, Prakasam-Dt , Andhra Pradesh, India,  
pathanosman@gmail.com

P V Sridevi<sup>2</sup>

<sup>2</sup>Department of Electronics and Communication Engineering, A U College of Engineering (A), Andhra University, Visakhapatnam, Andhra Pradesh, India

K V S N Raju<sup>3</sup>

<sup>3</sup>Department of Electronics and Communication Engineering, S.R.K.R.Engineering College, Bhimavaram, Andhra Pradesh, India

**ABSTRACT**—Plasmonic nanoantennas are the major key components for wireless communications. This article reports the design and analysis of compact general computing based effective resistance of an alternating circuit antenna at optical wavelengths 1264-nm and 1602-nm. Simulations using CST Microwave studio, return loss of -45dB is obtained at the bands and gain of 2.16 dBi and 3.541dBi respectively. The designed antenna shows a large length reduction with an estimation of uniform impedance resonator (UIR) antenna. Simulated radiation patterns are very important for wireless communication and the wavelengths shows a transmitting signals pattern.

**Keywords**—Plasmonic waveguide, CPW, Antenna, SIR

## I. INTRODUCTION

### A. plasmonics

Plasmonics is the study of the interaction of light and metal under precise circumstances. It is visible to the strongest points of both visible and operating components data to transfer; it allows and transfer data over very small wires. The term "PLASMONICS" is derived from Plasmon's.

### plasmons

They density light waves of electrons are created when light hits the rough metal surface. The optical frequencies are generated at density waves and they are very small and short. They can process a lot of information, theoretically more than possible electronics. Plasmons are the Nanostructure metals. Plasmon's improved the creation of whole between photonic and electronic devices. They are naturally similar size and interfaces with electronic components. And it also interfaces with similar electronic signals and operating speed by nature of the structure. Researchers can bind a small round stone together, but to achieve a technology that has the capacity of smallest electronics and electronic signals with the best bridge, Researchers are experimenting with such technology called "PLASMONICS". PLASMONICS breaks the fact that the light interacts with small structures and succeed that the light waves interact only with wave lengths and not with any other smaller things.

### SURFACE PLASMON POLARITONS

The Plasmon polarities of Surface waves are trapped on the surfaces owing metals and there is interaction between the free electrons in

electromagnetic field in a dielectric, and reduce exponentially in the perpendicular direction to the interface. And it is compared with insulator and metal-insulator and waveguides of plasmonic; there are so many kinds of waveguide plasmonic filters: They are

1. Tooth-shaped waveguide Plasmonic filters
2. Channel drop filters with disk resonators
3. Rectangular geometry resonators and ring resonators

There are two types of plasmonic filters in Metal-insulator-metal waveguides, band-pass and band-stop filters.

Surface Plasmon polarities (SPP) are electromagnetic excitations propagating along the metal-dielectric interface, with its evanescent field decayed in the perpendicular direction dielectric non-absorbing material and a metal, as illustrated in Fig.1. (a)The electric field decay in both half spaces as illustrated in Fig.1. (b). We begin our analysis by examining the physical properties of SPP. For reducing complexity, we assume there is no spatial variation in the in-plane  $y$  direction. The permittivity varies only on the  $z$  direction and the plane  $z=0$  is the interface of the two materials. Waves propagate in the  $x$  direction along the interface.

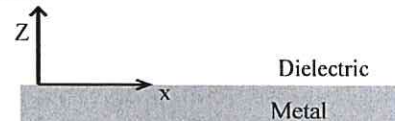


Fig.1 (a). Single metal-dielectric interface and field profile of SPP mode.

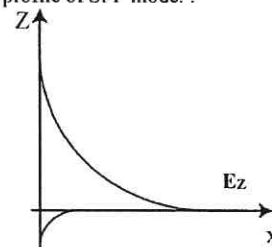


Fig.1 (b).Schematic illustration of the electric field decay in both dielectric and metal layers.

# Plasmonic Square Ring Resonator Based Band-Stop Filter Using MIM Waveguide



P. Osman, P. V. Sridevi, and K. V. S. N. Raju

**Abstract** This paper presents a plasmonic square ring resonator based band-stop filter using MIM (metal-insulator-metal) waveguide. The waveguide operates at optical wavelength  $\lambda = 1296$  nm. The plasmonic square ring resonator is formed with square ring cascaded with two feed-lines. The input feed-line is given at  $180^\circ$  and output feed-line is given at  $270^\circ$  of the square ring resonator. A full-wave simulation has been performed using a full-wave simulation CAD software CST microwave studio. The plasmonic square ring resonator based band-stop filter is very attractive and useful in the applications of photonic integrated circuit (PICs).

**Keywords** Band-stop filter · MIM waveguide · Plasmonics · Photonic integrated circuits

## 1 Introduction

Nanophotonics offers extensive awareness as a new technical innovation to overcome the diffraction limit for reducing the size of the photonic integrated circuits into nanoscale [1]. The limitations of the light wave in subwavelength scale lead through the localization and surface plasmons propagation along with the interface of MIM waveguide recently, several research on nano-plasmonic metal-insulator-metal (MIM) waveguides [2, 3] are confirmed to be more effective technique for guiding the light with nanoscale mode. Different nanophotonic waveguide devices have been

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P. Osman (✉)

Department of Electronics and Communication Engineering, Dr. Samuel George Institute of Engineering and Technology, Prakasam-Dt, Darimadugu, Markapur, Andhra Pradesh, India  
e-mail: pathanosman@gmail.com

P. V. Sridevi

Department of Electronics and Communication Engineering, Andhra University College of Engineering (A), Andhra University, Visakhapatnam, Andhra Pradesh, India

K. V. S. N. Raju

Department of Electronics and Communication Engineering, SRKR Engineering College, Bhimavaram, Andhra Pradesh, India

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