

# News@ComSoc Bangalore

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May 2018



## ABOUT IEEE COMSOC CHAPTER BANGALORE NEWSLETTER

The IEEE ComSoc Chapter Bangalore Newsletter includes news useful to its members, non-member and highlights most important technology development. It also highlights important concluded and upcoming events. Links for few important topics from current issue of *IEEE Communication Magazine* are also embedded.

### EDITOR MESSAGE

Dear readers

It is my great pleasure and honour to serve as editor of the news letter of IEEE ComSoc Bangalore section. We are delighted to launch the 3<sup>rd</sup> issue of IEEE ComSoc news letter Bangalore section. I would like to thank the chair and ExCom for giving me this opportunity in bringing the third issue of the news letter. The news letter highlights the activities achievements carried out in the past six months. We also have included the articles of current trends in communication community and job opportunity, higher education information in both national and international. I hope the news letter brings together the community and generate more interest in IEEE activities for social and technology development.

Suggestions are welcomed.

With warm regards

Triveni.C.L

News letter Editor, IEEE ComSoc Bangalore Chapter

[trivenicl@ieee.org](mailto:trivenicl@ieee.org)

### CHAIRMAN MESSAGE

DEAR IEEE MEMBERS,

We are in the second year of this newsletter.

This is one of the recent initiatives of ComSoc Bangalore. There are many new initiatives being planned and slowly executed. I am not discussing them in this column but I would definitely like to highlight the "T-TIME Charcha", that is, Tea/coffee – Technology Innovation, Management and Entrepreneurship event. The event is FREE, half day, afternoon preferably on 2nd Saturday on every alternate month starting from June 2018. The event will witness high profile talks on technology, innovation and successful entrepreneurship. ComSoc planned to conduct this event in the industry and looking for volunteer organization to host this event. Please contact us if interested to host.

Coming back to newsletter related, I would like to sincerely thank the readers for their feedback and interest in this newsletter/magazine. We have been receiving many articles requesting to include; perhaps, we may have to increase the length in future.

I congratulate and thank all the contributors and companies who extended their support in bringing this Newsletter. I sincerely thank our team and Ms. Triveni in particular who has worked very hard to compile the contents and material in bringing this up.

I am sure that with the help of active IEEE volunteers, we will be able to keep the momentum in publishing attractive IEEE ComSoc Bangalore India Newsletter in the months and years to come.

With warm regards,

Navin Kumar, PhD

Chairman, IEEE ComSoc Bangalore Chapter



## INSIDE THIS ISSUE

1.	About ComSoc and ComSoc Bangalore Chapter & Events	Page - 2
2.	New Initiative by ComSoc Chapter	3
3.	5G Technology and Cellular System: Tutorial Series Part 3	4
4.	Why Third Party Software Components are first class citizens in Product Security ?	5
5.	Cockpit Checklist Evolution	6
6.	System performance analysis and user experience design of 4G network.	7
7.	Global fiber Network Survivability Scenario	9
8.	Student Branch Chapter Information	10

## ABOUT IEEE COMSOC AND COMSOC BANGALORE CHAPTER

Since IEEE Communications Society (ComSoc) began operations in January 1972 (IEEE founded in 1963) as an independent Society of The Institute of Electrical and Electronics Engineers (IEEE) with over 32,000 members, IEEE ComSoc has become the premier international forum for the exchange of ideas on communications technologies and information networking.

IEEE ComSoc has evolved into a diverse group of global industry professionals with a common interest in advancing all communications technologies. Members interact across international and technological borders to: Produce publications; Organize conferences; Foster educational programs; Promote local activities; Work on technical committees.

IEEE GLOBECOM, IEEE ICC, and other conferences have earned international reputations. Publications increasingly support local and international coverage of important issues, and the Board of Governors reflects the changing direction of global communications technology.

Volunteer members of+ the society shape the course of IEEE ComSoc, its publications, technical activities, and conferences while the society's strength comes from the vision and dedication of its members and staff.

IEEE ComSoc members stay on top of the world of communications technology by accessing up-to-the-minute technical information, networking with other experts in the field, and leveraging many other exclusive benefits.

Formed in 2008 by an initiative from Prof T Srinivas, IISc, ComSoc Bangalore chapter has evolved and currently enjoys around 300 professional members from academia and industry. Today, ComSoc Bangalore chapter is one of the most vibrant and dynamic chapters with a large number of expert volunteers performing diverse tasks for the growth of the society and lives of the people. ComSoc Bangalore Chapter is known for the quality event. A huge support is extended to ComSoc chapter and volunteers by industry around.

## IMPORTANT EVENTS (JAN 2018 – MAY 2018):

EVENT NAME	DATE AND MONTH	VENUE
COMSoc AGM	JAN 07, 2018	Shangri –La Hotel Bangalore
Two days IEEE workshop on Research Methodology	May 2-3, 2018	Dayananda Sagar College of Engineering, Bangalore.
IEEE SJCE student branch Inauguration and Talk Series	Apr 28, 2018	St Joseph Engineering College, Mangalore
UPCOMING EVENT		
5G Technology Workshop Register - <a href="https://in.explara.com/e/ieee-5g-technology-workshop-blr/">https://in.explara.com/e/ieee-5g-technology-workshop-blr/</a> Details - <a href="http://bangalore.chapters.comsoc.org/events-3/workshop/upcoming-workshop/">http://bangalore.chapters.comsoc.org/events-3/workshop/upcoming-workshop/</a>	29-30 June, 2018	Mac Sterling Hotel, Bangalore

## NEW INITIATIVE BY COMSOC BANGALORE RESEARCH METHODOLOGY WORKSHOP SERIES

An initiative by ComSoc is the Research Methodology Workshop Series. It has become a platform for real knowledge distribution. The objective of this workshop is to let the research community including young research scholars to understand the process involved in doing research starting from problem definition to peer review process. This workshop is expected to give a tutorial like session on different topics like How to define a problem, how to do research, how to publish and how to do peer review. This event has been a great success and participants from different cities who attended would like to request organizing committee to continue. We plan at least 3-events every year with one of them to be outside Bangalore. Organization, institutions who are interested in hosting the event, kindly get in touch with Chair/Secretary ComSoc. In the first quarter, we conducted a workshop as the first edition in 2018 during May 2-3, 2018 at Dayananda Sagar College of Engineering, Bangalore.



## IEEE SJCE STUDENT BRANCH

IEEE Student Branch provides an opportunity for IEEE Student members to begin networking in their areas of interest and future profession. ST Joseph Engineering College, Mangalore (SJCE) has very active student branch and inaugurated the ComSoc student branch chapter on 28<sup>th</sup> April, 2018. Such chapter mostly involves young professional and a path to access the experts from other academia and industries. Many students and faculty involved in this event to make this event successful. Student branch also arranged technical talks for half day. Dr. Navin Kumar, the chair and secretary Anand M who visited during the inauguration addressed the gathering and motivated the students and explained the benefits of establishing student branch. Management is found to be very supportive at SJCE. We extended seed money for inauguration of ComSoc student branch chapter. We extend all possible support in future.



Dear Reader, we plan to dedicate this page for 5G Tutorial Series. Starting from the basic, I would like to continue discussing about 5G Cellular System and Technologies in sequence (starting from Part 1, Part 2, .....). The tutorial will be in continuation from the previous issue. I hope, we will go in parallel with ongoing 5G research and development. It is believed that the reader will gain better understanding of 5G Cellular System if they follow the tutorial. In this Part 1, we start with the basic definition, important specifications and in part 2 the requirements of 5G is addressed and in this issue evolution wireless mobile technology of 5G is answered. I would welcome any suggestion from you.

Navin Kumar, PhD, Associate Professor, Amrita School of Engineering Bangalore

### 5G TECHNOLOGY AND CELLULAR SYSTEM TUTORIAL SERIES: PART III – ENABLING TECHNOLOGIES

In the preceding parts of this series, we discussed the need for wireless mobile technology to evolve to the fifth generation (5G) and also overviewed 5G requirements stated by the standard bodies to enable enhanced mobile broadband communications with superior performance in comparison to earlier generations. Clearly, various enabling technologies are envisioned to address these diverse requirements and we briefly discussed two key technologies, mmWave and multi radio access technology (multi-RAT), that will make 5G interesting. These technologies are typically chosen by examining the requirements of various 5G use case services. For instance, if the network needs extremely low communication latency, then the mmWave systems with enhanced device to device (D2D) communication capability or with advanced networks are considered. The mmWave technology can be combined with advanced MIMO and/or advanced modulation, coding (ACM) and multiple access (MA) schemes applied at the physical layer to improve the mobile experience in terms of data rate and network connectivity. This part commences with the remaining enabling technologies.

A novel advance MIMO technique proposed for 5G is Massive MIMO that accommodates a very large number of antenna elements at both base stations and mobile devices to offer multiple spatial dimensions for signalling, thereby, increasing the spectral efficiency. Such architecture for MIMO offers best performance if its channel matrix is statistically independent and this can be achieved by an appropriate choice of antenna element spacing. Though MIMO concept was used in 4G systems, massive MIMO was disapproved because of the base station (BS) form factors and carrier frequencies. For example, to install large number of antenna elements at microwave frequencies would require few metres, which offer deployment limitations even at the BS side. A full dimension MIMO (FD-MIMO) that places antenna elements in a 2-D grid may solve this limitation, yet it appears that the massive MIMO structures will inherently benefit from the small wavelength of mmWaves as the antennas in this regime are much smaller and large numbers can fit into smaller areas due to reduced lambda spacing.

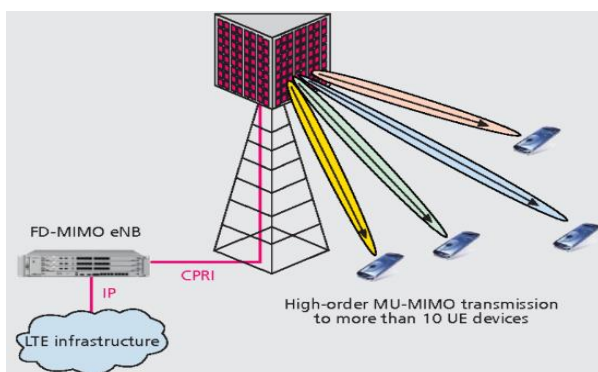


Fig. 1: Massive MIMO Architecture

Though, the technology seems to be very promising to realize the enhanced mobile broadband (eMBB) communications; for major application of 5G- it poses several architectural challenges such as transceiver scalability, antenna correlations and couplings. Also, unlike the existing linear horizontal arrays that exploit the angular dimension in azimuth plane, a 2-D planar array in FD-MIMO will have to additionally exploit the elevation angle. Very limited channel modelling study that deals with both azimuth and elevation beamforming is available till date. Furthermore, acquiring channel state information (CSI) and precoding the transmit signals in multiple transceiver scenario pose new challenges.

Cellular technology, from 1G to 4G- has explored novel modulation and/or MA schemes to meet the challenging requirements of throughput and spectral efficiency. For instance, 1G was based on FDMA while TDMA was the defining waveform design for 2G. The spread spectrum approach for CDMA was introduced in 3G whereas OFDM became the dominant approach to LTE based 4G systems as the data applications for 4G demanded higher signal bandwidths. Specifically, OFDM was used for resource allocation in the digital domain and OFDMA was employed at the subcarrier level. Though, OFDM offers a lot of advantages and benefits tremendous support from industry, a few weak points do raise certain questions. The major concerns include its high peak-to-average-power ratio (PAPR), requirement of strict orthogonality, bottleneck of cyclic prefix (CP) and above all, its applicability to mmWave spectrum given the complexity in developing efficient power amplifiers at these frequencies. Novel modulation techniques such as pulse shaping, filtering and precoding are used to reduce the out-of-band leakage of signals in OFDM. This includes generalized frequency division multiplexing (GFDM) and filter bank multicarrier (FBMC) based on pulse shaping technique whereas universal filtered multicarrier (UFMC) and filtered OFDM (f-OFDM) based on sub band filtering. Adherence to orthogonality is a major hindrance in massive machine type communication (mMTC) scenario where numerous sensor nodes transmit data asynchronously in narrow bands (low data rate). Accordingly, non-orthogonal multiple access (NOMA) techniques are proposed for 5G in place of orthogonal multiple access (OMA) techniques such as FDMA, TDMA, CDMA and OFDMA. NOMA allows to fully use the available spectrum to support increased connectivity, high spectral efficiency, low transmission latency and relaxed channel feedback, indeed at the expense of additional complexity and interference at the receiver.

Sheeba Kumari M, PhD Scholar  
Navin Kumar, PhD

**IMPORTANT LINKS**<http://www.comsoc.org/><http://www.comsoc.org/free-tutorials><http://www.comsoc.org/whitepapers><http://www.comsoc.org/training/training-calendar/road-5g><http://www.comsoc.org/tech-focus><http://www.comsoc.org/ctn/death-and-possible-rebirth-dsp><http://globecom2018.ieee-globecom.org/><http://icc2018.ieee-icc.org/><http://www.comsoc.org/comstandardsmag>[http://www.ieee.org/about/volunteers/volunteer\\_index.html?WT.mc\\_id=dhtml\\_vol\\_see](http://www.ieee.org/about/volunteers/volunteer_index.html?WT.mc_id=dhtml_vol_see)

## READER'S CHOICE (VOTE & WIN)

Vote for the best article and win surprise prize.

Please follow the link to vote:

[https://docs.google.com/forms/d/1RRKwAvnzq2dzS5P6rC\\_Src7t6Ab8f9P8xADI5P2NeBs/edit](https://docs.google.com/forms/d/1RRKwAvnzq2dzS5P6rC_Src7t6Ab8f9P8xADI5P2NeBs/edit)

The winner will be announced in the next issue.

## CALL FOR CONTRIBUTION TO COMSOC NEWS

Please get in touch with us if you wish to write and to be included in this newsletter (in the area of Communication Technology). The article should be from 300-1000 words in docx or doc file and separate image jpeg or tiff file format. You can submit to: ([trivenicl@ieee.org](mailto:trivenicl@ieee.org) and [navinkumar@ieee.org](mailto:navinkumar@ieee.org))

This knowledge and the actual exploited (tools to compromise a system) could be used to attack the Confidentiality, Integrity and Availability (CIA) of a software product.

Hence, more than securing product's own source code which is definitely necessary, it is extremely crucial to prioritize securing the third party software components used in the product as vulnerabilities in these 3<sup>rd</sup> party components are publicly known and might be used for potential attacks.

It is imperative to use the least vulnerable version of 3<sup>rd</sup> party software components in building a secure product. So, it's not an exaggeration to say third party software components are first class citizens in product security.

### WHY THIRD PARTY SOFTWARE COMPONENTS ARE FIRST CLASS CITIZENS IN PRODUCT SECURITY?

Satish Sreenivasaiah, Mohan Jayaramappa  
TCS Product Trustworthy CoE

In today's world, as a software product development organization, no one can claim to build a product without the use of Open Source Software (OSS). According to a survey conducted by Black Duck Software Company, 95% of the applications use OSS components and 67% of the applications contained vulnerabilities due to 3<sup>rd</sup> party software components. OSS provides a huge head start in building new applications by enabling leverage of existing 3<sup>rd</sup> party software components. The advantage of using these brings along the disadvantage of inherent security vulnerabilities that may pre-exist in these components.

Product teams need to ensure that these vulnerabilities are addressed prior to using them in building their products. There are multiple OSS tools such as Open Web Application Security Project (OWASP) dependency check and other commercial tools that help in finding security vulnerabilities in the 3<sup>rd</sup> party software components. Such tools check against National Vulnerability Database (NVD) from NIST, US and a few other databases to identify vulnerabilities in these components. NVD also provides solutions and recommendations on fixing the vulnerability either by patching the software or through a work around.

Since, NVD is a public database available to all, it is evident that product developers as well as hackers would get sufficient insights into the vulnerabilities in the 3<sup>rd</sup> party software components.

### IF YOU WISH TO ADVERTISE

Please contact us to advertise in the newsletter. Newsletter is electronically circulated to more than 6000 members among IEEE communities. Increase your visibility with us.

Navin Kumar ([navinkumar@ieee.org](mailto:navinkumar@ieee.org))  
or Anand M ([anand.m@ieee.org](mailto:anand.m@ieee.org)) and  
Ms Triveni CL ([trivenicl@ieee.org](mailto:trivenicl@ieee.org))

## COCKPIT CHECKLIST EVOLUTION

*Bazawada, Suresh and Naseeruddin, Mohammed  
Honeywell Technology Solutions Pvt Ltd*

A cockpit checklist is used as a memory guide for pilots to configure the complex systems in aircraft for safe flying and overcome the abnormal conditions. This paper deals with the origin, evolution, present and future state of cockpit checklist.

### Overview:

Based on phase of flight, the pilot has to configure the aircraft for safe and efficient flight. For example before takeoff phase of flight, the pilot has to verify that flight controls are free and correct, instruments and radios are checked and set, landing gear position lights are working, etc. A checklist is used for aiding the pilot in recalling the process of configuring the plane. It ensures that all critical actions are taken, reduce variability between pilots and enhance coordination during high workloads and stressful conditions.

### Origin of Cockpit Checklist:

In 1934, three manufactures had submitted aircraft for testing for the final phase of aircraft evaluations under U.S. Army specification 98-201; Martin, Douglas and Boeing. During the flight test the Boeing model made a normal taxi and takeoff. It began a smooth climb, but then suddenly stalled. The aircraft turned on one wing and fell, bursting into flames upon impact. The investigation found "Pilot Error" as the cause. Because of this accident the contract went to Douglas. However, 13 aircrafts were also ordered from Boeing. The pilots sat down and put their heads together. What was needed; some way of making sure that everything was done; that nothing was overlooked. That resulted in a pilot's checklist. Initially, four checklists were developed - takeoff, flight, before landing, and after landing. These checklists for the pilot and co-pilot made sure that nothing was forgotten.

### Types of Cockpit Checklist:

#### A. Paper Checklist

The first form of checklist was a paper format (Refer Figure 1). Paper checklists consist of a list of items written on a paper card. In most cases, the card is held in the pilot's hand, or clipped to the yoke or glued to the instrument panel or written on a placard attached to the yoke. The major advantage of a paper checklist is its simplicity and ease in customizing the content.

Drawbacks of paper checklists are that they do not have a pointer to indicate the last item which was accomplished and fails to differentiate between accomplished and non-accomplished items. On emergency situations the pilot has to search through the checklists to the abnormal checklist corresponding to the situation.

#### B. Scrollable Checklist

The scroll checklist (Refer Figure 2) consists of a narrow strip of paper that scrolls vertically between two reels. The reels and paper are contained inside a box fitted with a window and a lubber line. After completing an item on the checklist the pilot rotates the reels to position the next item on the lubber line.

B-32 CHECK LIST	
Suitable For Use With 100 Octane Fuel Only	
<b>BEFORE ENTERING AIRPLANE</b>	Calculator Air Filters— <b>IS REQUIRED</b>
Visual Inspection of Airplane	Calculator Heat— <b>OFF</b>
Pilot Head Cover Removed	Antiskid Wipes and Pads— <b>OFF</b>
Tire and Deo Inflator	Electrical Hye Pump Switch— <b>ON</b>
Wing Checks in Place	Painting Brakes— <b>ON</b>
Trim Tabs Neutral	Hydraulic Brake Pressure— <b>CHECK</b>
Crew Inspection	
<b>BEFORE STARTING ENGINES</b>	<b>STARTING ENGINES</b>
Landing Gear Switch— <b>NEUTRAL</b>	Fuel Selector Valves— <b>TANK TO ENGINE</b>
Forms and OA	Booster Pumps— <b>ON LOW</b>
Fuel and OA	(Per Fuel Pressure Ind. and Mixture Control is Moved)
Loading, WITHING G. LIMITS	Fire Guard and Call CLEAR
Wipers— <b>OFF</b>	Master Ignition Switch— <b>ON</b>
Prop. FULL THROUGH & BLADES	Ignition Switch— <b>ON AFTER TWO</b>
Control Movement FREE	PROP. REVOLUTIONS
Altimeter— <b>SET</b>	Mixture— <b>AUTO RICH AFTER</b>
Safety Switches— <b>ON</b>	<b>ENGINE IS RUNNING</b>
A.P.U.—Start, Equalizer Switch OFF	
Inverter Switch— <b>AIR ON</b>	<b>WARM UP</b>
Prop. Feather Switches— <b>NORMAL</b>	Fuel and Oil Pressure
Prop. Reverse Safety Switches— <b>SAFE</b>	Booster Pumps— <b>OFF</b>
Prop. Reverse Pitch Switch— <b>NORMAL</b>	Vacuum and Light Indicator
Prop. Selector Switches— <b>AUTO-MATIC</b>	Generator— <b>ON, ON</b>
Prop. Power Control— <b>ON</b>	A.P.U. Equalizer Switch— <b>ON</b>
Prop. Master Mover Switch— <b>ON</b>	Inverter— <b>CHECK</b>
All Ground Switches— <b>ON</b>	Wing Flaps— <b>OPERATE</b>
Throttle— <b>1000 R.P.M. Position</b>	Prop. Control— <b>CHECK R.P.M. CHANGE</b>
Taxi (Gear Retracted)	Magneto— <b>CHECK AT 2000 R.P.M.</b>
Mixture Control— <b>SOLE CJT OFF</b>	
Wingtip Flaps— <b>AUTO/TWO</b>	
Oil Cooler Flaps— <b>AUTOMATIC</b>	

Figure 1: Paper Checklist



Figure 2: Scroll checklist



Figure 3: Electromechanical Checklist

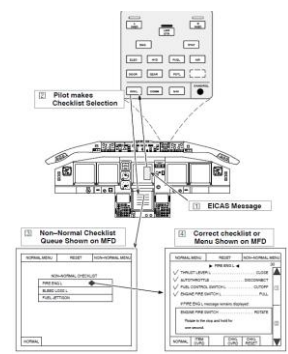


Figure 4: Electronic Checklist

After completing an item on the checklist the pilot rotates the reels to position the next item on the lubber line.

The main advantage of the scroll checklist compared to paper checklist is that it has a pointer system to reduce pilot workload. However, it is unable to solve the problem of identifying deferred items as it relies on memory to store the deferred items.

#### C. Mechanical/Electromechanical Checklist

A mechanical checklist (Refer Figure 3) consists of a small panel that contains several plastic slides moving over a list of checklist items. As the item is accomplished, the slide is moved to cover the item's nomenclature. Consequently, only the non-accomplished items are displayed. Very similar in concept is the electromechanical checklist, this device is made of a small panel with an internally-lighted list of items. Alongside each checklist item, a toggle switch is mounted. When the item is accomplished, the switch is turned off, and the light below the item's nomenclature is extinguished to indicate that the item has been completed.

The advantage of these checklists is that they have a pointer system.

#### D. Voice Checklist

A vocal checklist reads out the checklist items in a male or female voice. The pilot will be able to read the items without changing focus from outside. The voice presentation reduces pilot visual workload resulting in better situational awareness and enhanced safety.

The voice presentation reduces pilot visual workload resulting in better situational awareness and enhanced safety.

Voice checklist has two push buttons; an 'acknowledge' button is used when an item is accomplished and a 'proceed' button is used to move to next item.

Disadvantage of this checklist audio can be masked and blended into the cockpit communications.

### E. Electronic Checklist

With the digitization of the cockpit, the Electronic Checklist (ECL) (Refer Figure 4) evolved. It has overcome the disadvantages of other checklist devices. ECL indicates the unaccomplished line items and memory to store the deferred items and became superior to other type of checklists.

In 1995 Boeing came up with the concept of an ECL for presenting Normal and Non-Normal checklists. Two types of checklist line items are proposed; "Open Loop" item which needs to be checked off by crew member and "Closed Loop" item which is completed without action of the crew member. Linkage of Non normal checklists to the Crew Alert System was also proposed, so that checklist containing procedures to be executed for particular a failure condition will pop up to the crew member.

### Advanced Technology:

#### A. Touch Screen and Gesture Control

Touch screen and gesture controls provide better interface to operate a checklist. Operation can be done directly on the display rather than using a separate device to perform checklist operation. In the case of touch screen, the pilot can check an item by directly touching on the item or defer or override the item by touching the corresponding soft keys in the display.

#### B. Voice Recognition

With the improvements in Digital Signal Processing, pilot can operate the checklist with voice command thereby reducing pilot head down time and work load. With the integration of voice checklists as described above the challenge response method of usage can be done without a second crewmember.

#### C. Wearable Displays

A near-eye display is a wearable device that creates a display in front of the user's field of vision so pilot miss will be less by popping out the incomplete items near the eye of pilot.

## COMSOC T-TIME CHARCHA

A unique and innovative idea Tea/Coffee - Technology Innovation, Management and Entrepreneurship Charcha (event) is conceived. A FREE half day event to discuss on the above topics by Experts. Host organization, preferably from Industry if willing to host, kindly contact us.

Dr Navin Kumar, [navinkumar@ieee.org](mailto:navinkumar@ieee.org)

Ms Triveni CL ([anand.m@ieee.org](mailto:anand.m@ieee.org))

## SYSTEM PERFORMANCE ANALYSIS AND USER EXPERIENCE DESIGN OF 4G NETWORK: A CASE STUDY ON INDIAN SUB-CONTINENT

Mr. Samir Kanta Satapathy, MIEEE  
samir.satapathy@gmail.com

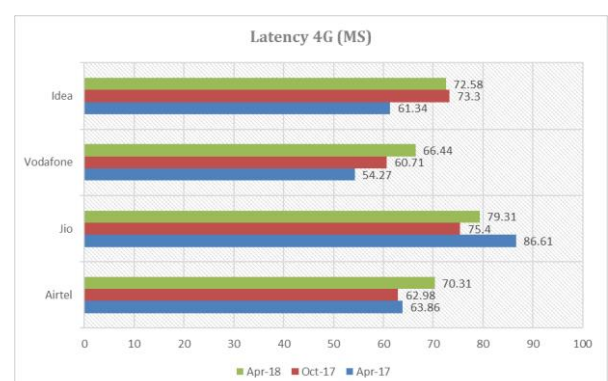
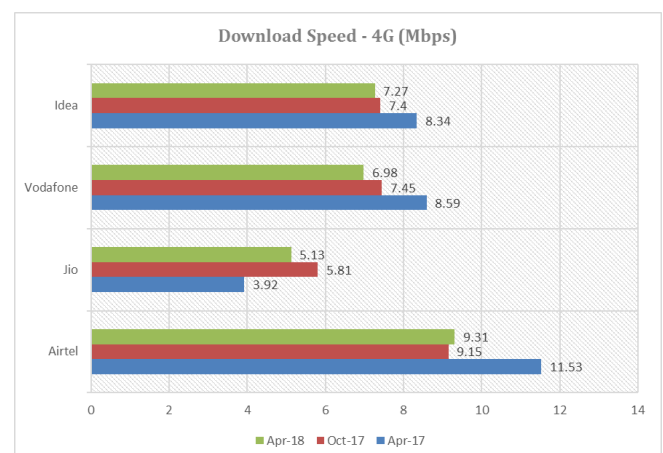
### Overview

The world is preparing towards 5G with offerings of tens of Gbps speed, with latency of half a ms, and almost 100% of availability. The proposed timeline is 2020 to start commercialization. The existing deployment is 2G, 3G and 4G Long Term Evolution. While transitioning from 4G to 5G, the stages includes LTE Pro (4.5G) and LTE Pro Advanced (4.9 G) with a theoretical matching speed of Gigabits.

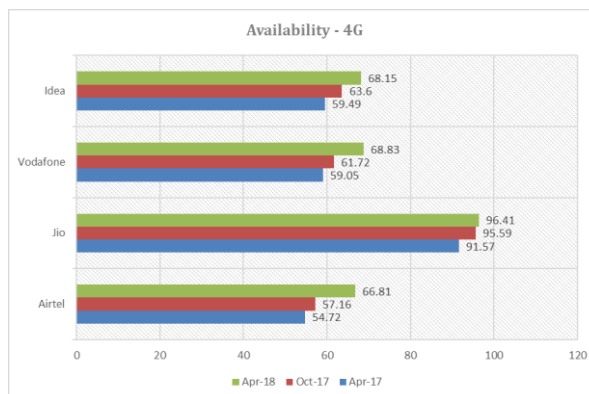
However, there is a huge gap in the theoretical (testbed) and deployed network scenarios. The article attempts to find out the user experience and perception for the commercial deployed network. The present study is on the Indian Subcontinent which involves 20 Telecom Circles with 4 Mobile Network Operators.

Three aspects of user experience have been considered for the 4G deployed networks.

- The availability (4G coverage availability, ICR).
- The download throughput (Network speed, buffering of streaming videos, Packet loss).
- Latency (delay, jitter, round trip time).



The data are taken from the Open Signal and TRAI for comparative analysis.



### Observations

**Availability** - Reliance JIO is clearly providing the dominant 4G availability across India with more than 95%. Airtel is improving its 4G availability in terms of accessibility but worst to the competitors.

**Download Throughput** - Airtel has given excellent user experience for download speed, however, the speed is deteriorating from 11.5Mbps to 9.3Mbps.

**Latency** - Vodafone is fairing better in terms of RTT (Round Trip Time) to 60 ms across India where Jio has shown the worst with averaging to 80ms.

### Recommendation

User experiences are a key differentiator and a new service offering for most of the Mobile Network Operators across globe. These below steps can be taken for a smooth and seamless user experience management.

- Simulation for Coverage (RSRP, RSRQ, SINR, CQI)
- Soft Capacity (Massive MIMO, related advanced Features)
- Hard Capacity (Spectrum, Interfaces, Densification)
- Mobility (HO and Layer Strategy)
- Probing and data validations.

### Job Search

#### Post Doc @ IT Aveiro, Portugal

Post Doc position on Wireless Communications and networks is particularly focused on coordinated spectrum sharing for opportunistic access. The main goal is to investigate innovative spectrum authorization schemes that may be adopted by opportunistic unlicensed users to overcome the underperformance caused by coexisting users and radio technologies.

Candidates must hold a PhD in Telecommunications, electrical, or Computer Engineering (or closely related disciplines) and have the potential to publish in world's top-ranked journals and conferences.

please email a copy of full CV including details of academic records and a list of publications to Rodolfo Oliveira ([rado@fct.unl.pt](mailto:rado@fct.unl.pt)) with subject "CoSHARE Post-doc application".

## JOB/RESEARCH

### Internship and Job – UG/PG

@ Amrita, ECE Dept. (B Tech ECE, 01); M Tech (CSE or ECE -01) for one year as Research Asst. ([nayankumar@ieee.org](mailto:nayankumar@ieee.org))

@ ThingTronics, B Tech (>65%), (ECE/CSE -04); MBA -02, contact - [rk.arvapally@thingtronics.com](mailto:rk.arvapally@thingtronics.com).

@ Terminus Circuits, M Tech VLSI (03); ([gsjaved@ieee.org](mailto:gsjaved@ieee.org))

@WoW Studio, Acct Manager 02[ contact [lopa@worldofwostudio.com](mailto:lopa@worldofwostudio.com)

### MASTER Program:

@ BUPT China – Master Degree in ECE with Scholarship

Candidates to be from ASEAN countries.

The application (via Email) DEADLINE is August 20 2018. For

more details, please contact [yizhang2014@bupt.edu.cn](mailto:yizhang2014@bupt.edu.cn) or

[liujiang@bupt.edu.cn](mailto:liujiang@bupt.edu.cn)

### PhD Studentship Abroad

@Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brazil

- Multiple-antenna systems
- Channel coding: LDPC and Polar codes
- Machine-type communications
- Cloud-based techniques for wireless networks
- Internet of things (IOT)

Applicants should send an up to date CV with photo, a one-page personal statement, full contact details (including email addresses) of 2 referees, transcripts and publications to:

Prof. Rodrigo C. de Lamare, PUC-Rio - [delamare@cetuc.puc-rio.br](mailto:delamare@cetuc.puc-rio.br)

### # PhD Program Abroad CSE

<https://formationcontinue.um6p.ma/dscs/>

\*PhD position in the area of « Blockchain for IoT » is open at the Laboratory of Informatics Image Interaction (L3i ~ <http://l3i.univ-larochelle.fr>) of the University of La Rochelle (ULR - <http://www.univ-larochelle.fr/?lang=en>), located in the magnificent city of La Rochelle by the West (Atlantic) Coast of France. Applicants should e-mail their resume with a list of two references as well as transcripts to Prof. Yacine GHAMRI-DOUDANE ([yacine.ghamri@univ-lr.fr](mailto:yacine.ghamri@univ-lr.fr)), with [PhD Application] in the email subject. Applications will be accepted until this position is filled.

### POST DOC

\*Post-doctoral research fellowship in the area of « Blockchain for IoT » is open at the Laboratory of Informatics Image Interaction (L3i ~ <http://l3i.univ-larochelle.fr>) of the University of La Rochelle (ULR - <http://www.univ-larochelle.fr/?lang=en>), located in the magnificent city of La Rochelle by the West (Atlantic) Coast of France. Applicants should e-mail their resume with a list of two references as well as transcripts to Prof. Yacine GHAMRI-DOUDANE ([yacine.ghamri@univ-lr.fr](mailto:yacine.ghamri@univ-lr.fr)), with [Post-doc Application] in the email subject. Applications will be accepted until this position is filled

\*Post-doc position on security for will be soon available at the Department of Information Engineering, University of Padova, Italy (<http://www.dei.unipd.it>). Applicants should e-mail their resume with a list of two references as well as transcripts to Prof. Yacine GHAMRI-DOUDANE ([yacine.ghamri@univ-lr.fr](mailto:yacine.ghamri@univ-lr.fr)), with [Post-doc Application] in the email subject. Applications will be accepted until this position is filled



## GLOBAL FIBER NETWORK SURVIVABILITY SCENARIO

*Dr.K.V.S.S.S.S.Sairam - Professor,  
Chandra Singh -PG Scholar,  
ECE Dept,NMAMIT,Nitte,Karkala Taluk,Udupi District.*

In optical communication networks, survivability is a vital role in fiber demand distribution, fiber restoration, fiber assortment method, fiber integration method, fiber physical logical connectivity, node graph, flow graph, FSCR, fiber throughput and fiber bandwidth which describes the design of network with node and switch architecture. In these, several partial mesh and hierarchical topologies provide a most scalable solution for satisfying design constraint. Also, two network architecture are presented viz. Physical layer and logical layer and network elements which shares the sources and resources between end to end communications. It also facilitates the different network services hence network transparency should mitigate the security vulnerabilities that differ from conventional failures hence global fiber network survivability scenario. Optical network design in logical layer is hence forth provide multipath propagation of pacts by using transmission flow which consists of two queues slot and packet. Furthermore, it provides minimum fair channel allocation bandwidth, obtain maximum spatial channel reuse and maximum fairness throughput by using centralized packet scheduling algorithm. It also computes node mobility and scalability by using spatial channel reuse concept. Additionally, it also provides global topology model through which maximum distributed fair queuing throughput is achieved.

1. Develop models of optical-broadband access networks and trunk networks based on projected traffic growth.
2. Evaluate the impact of emerging technologies on network architecture design.
3. Develop routing algorithms for optical layered networks.
4. Investigates protection/restoration coordination schemes in the optical layer, i.e. physical layer topology.
5. Investigates protection/ restoration coordination schemes in the optical layer, i.e. physical layer topology.
6. Investigate the potential for packet switching procedures and burst switching in optical networks, i.e. Logical Layer Topology.

The Performance and Evaluation of Optical networks take into consideration the factors like trade-off between routing traffic at the optical layer, creating dedicated light paths in order to maximize the traffic carried and the availability of spare capacity.

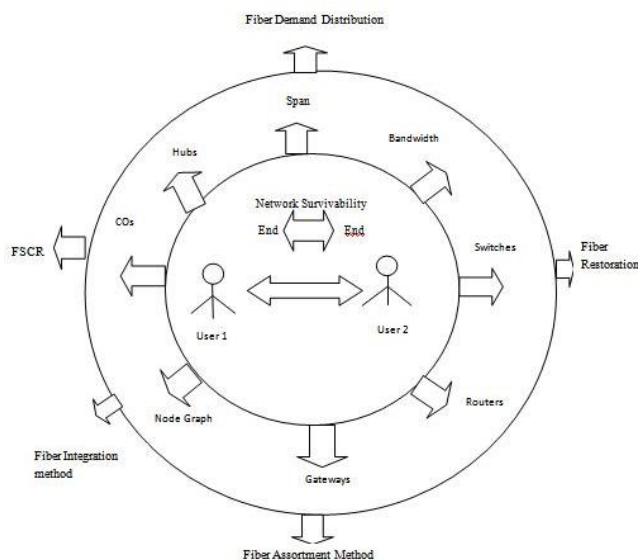


FIG. GLOBAL FIBER NETWORK SURVIVABILITY SCENARIO

## All in Three: How to Pitch Your PhD in 180 Seconds

[http://blogs.nature.com/naturejobs/2017/04/24/all-in-three-how-to-pitch-your-phd-in-180-seconds/?WT.mc\\_id=EMX\\_NJOBS\\_0427\\_NATUREJOBSNEWSLETTER\\_A&WT.ec\\_id=EXTERNAL](http://blogs.nature.com/naturejobs/2017/04/24/all-in-three-how-to-pitch-your-phd-in-180-seconds/?WT.mc_id=EMX_NJOBS_0427_NATUREJOBSNEWSLETTER_A&WT.ec_id=EXTERNAL)

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## STUDENT BRANCH CHAPTER INFORMATION

### AMRITA SCHOOL OF ENGINEERING, BANGALORE CAMPUS

ASE ComSoc Student Branch Chapter is formed in April 2016. The student branch has largest number of student members over 120 and perhaps the largest Student ComSoc Members. They conduct lot many activities and are very active.



<https://ieee-amrita.firebaseio.com/>



### Demystifying 5G and IoT - Seminar



### INDIAN INSTITUTE OF SCIENCE

Faculty Advisor – Prof T Srinivas, ECE Dept

### RVCE STUDENT BRANCH CHAPTER

RVCE ComSoc Student Branch Chapter is formed in the month of July 2016 with faculty advisor as Dr S Ravishankar, Professor in the Dept. of ECE.

Faculty Coordinator: K S Shushrutha Asst.

Professor, Dept. of ECE, RVCE

Student Chair: Prakhar Jain, Student, Dept. of ECE, RVCE

### START COMSOC STUDENT BRANCH CHAPTER IN YOUR ORGANIZATION/INSTITUTION

If you would like to start ComSoc Student Branch Chapter, please get in touch with us (Chair/Secretary). We will help you to establish.

### THANK YOU NOTE FOR THE CONTRIBUTORS

We would like to thank every author who showed interest and submitted their works. We could not include all of them mainly because of scope and relevance.

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