

IEEE ComSoc Society Radio Communications Committee (RCC)

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Minutes for the meeting held on May 23, 2018 IEEE ICC 2018, Kansas City, MO

1. Introduction

The Committee Vice-Chair Yuan Shen opened the Radio Communications Committee (RCC) meeting at 12:30 pm. There were 50 members present, and a list of participants is attached at the end of these minutes together with some photos. The Vice-Chair presented the agenda:

1. Welcome
2. Approval of Agenda
3. Approval of GC'17 RCC Meeting Minutes (available on the website)
4. Report on Conference/Workshop activities
5. Standardization Activities
6. New Business Items
7. Conferment of 2018 IEEE ComSoc RCC Outstanding Service Award
8. Conferment of 2018 IEEE ComSoc RCC Early Achievement Award
9. Invited talk: Dr. Santiago Mazuelas "Probabilistic processing of complex data"
Invited talk: Dr. Walid Saad "Unmanned Aerial Vehicles for Wireless Networking: An Overview"
10. Next RCC meeting
11. Adjourn

2. Approval of the Agenda

The agenda was approved.

3. Approval of IEEE GC 2017 RCC Meeting Minutes

The minutes (circulated via RCC email list and website) were approved.

4. Report on Conference/Workshops activities

Reports on the RCC sponsored conferences/workshops are available in the slides downloadable from the RCC website. Conferences/workshops and corresponding RCC representatives are listed below (see slides for details):

- **GLOBECOM 2017:** Andrea Conti (WC)
- **ICC 2018:** Andrea Giorgetti (SPC)
- **GLOBECOM 2018:** Yuan Shen (WC)
- **ICC 2019:** Julian Cheng (WC)
- **GLOBECOM 2019:** Enrico Paolini (CT), Fauzi Bader (CR)
- **ICT 2018:** Fauzi Bader, Tingting Zhang, Rwei-Hau Hsu
- **ASMS/SPSC 2018:** Tingting Zhang, Ahmed Elzanaty, Mohapatra Parthajit
- **WCSP 2018:** Nan Wu, Sudarshan Mukherjee, Ahmed Elzanaty
- **WiSEE 2018:** Ahmed Elzanaty, Sunwoo Kim, Hesham Elsayy
- **IINTEC 2018:** Ahmed Elzanaty, Sudarshan Mukherjee, Tingting Zhang
- **ICSPCS 2018:** Tadeusz A Wysocki, Lajos Hanzo, Hans-Juergen Zepernick

5. Report on Standard Activities

ComSoc Standards Board Technical Committee Liaisons Report

The RCC representative, *Dr. George Chrisikos*, prepared slides to report on standards activity. The ComSoc Standards Board (SB) objective is the discussion of IEEE/ComSoc standards development projects, new standardization initiatives, procedures, operational issues, and in partnership with the IEEE-SA Standards Board.

IEEE Communications Society (ComSoc) Standards Development Board (SDB)

- **Approved standards:**
 - IEEE 661-1979: IEEE Standard Method for Determining Objective Loudness Ratings of Telephone Connections
 - IEEE 1902.1-2009: IEEE Standard for Long Wavelength Wireless Network Protocol
 - IEEE 1329-2010: IEEE Standard Method for Measuring Transmission Performance of Speakerphones
 - IEEE 269-2010: IEEE Standard Methods for Measuring Transmission Performance of Analog and Digital Telephone Sets, Handsets, and Headsets
 - IEEE 269a-2012: IEEE Standard Methods for Measuring Transmission Performance of Analog and Digital Telephone Sets, Handsets, and Headsets – Amendment 1
 - IEEE 1652-2016: IEEE Standard for Translating Head and Torso Simulator Measurements from Eardrum to Other Acoustic Reference Points
- **Active projects:**
 - P269: Standard for Measuring Electroacoustic Performance of Communication Devices

- P2784: Guide for the Technology and Process Framework for Planning a Smart City

Dynamic Spectrum Access Networks Standards Committee (DySPAN-SC)

- **Approved standards:**

- IEEE 1900.1-2008: IEEE Standard Definitions and Concepts for Dynamic Spectrum Access: Terminology Relating to Emerging Wireless Networks, System Functionality, and Spectrum Management
- IEEE 1900.2-2008: IEEE Recommended Practice for the Analysis of In-Band and Adjacent Band Interference and Coexistence Between Radio Systems
- IEEE 1900.4-2009: IEEE Standard for Architectural Building Blocks Enabling Network-Device Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Access Networks
- IEEE 1900.4a-2011: IEEE Standard for Architectural Building Blocks Enabling Network-Device Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Access Networks Amendment 1: Architecture and Interfaces for Dynamic Spectrum Access Networks in White Space Frequency Bands
- IEEE 1900.5-2011: IEEE Standard for Policy Language Requirements and System Architectures for Dynamic Spectrum Access Systems
- IEEE 1900.6-2011: IEEE Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems
- IEEE 1900.1a-2012: IEEE Standard Definitions and Concepts for Dynamic Spectrum Access: Terminology Relating to Emerging Wireless Networks, System Functionality, and Spectrum Management Amendment 1: Addition of New Terms and Associated Definitions
- IEEE 1900.4.1-2013: IEEE Standard for Interfaces and Protocols Enabling Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Networks
- IEEE 1900.6a-2014: IEEE Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems – Amendment 1: Procedures, Protocols, and Data Archive Enhanced Interfaces
- IEEE 1900.6-2011/Cor 1-2015: IEEE Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and Other Advanced Radio Communication Systems – Corrigendum 1
- IEEE 1900.7-2015: IEEE Standard for Radio Interface for White Space Dynamic Spectrum Access Radio Systems Supporting Fixed and Mobile Operation
- IEEE 1900.5.2-2017: IEEE Approved Draft Standard Method for Modeling Spectrum Consumption

- **Active projects:**

- P1900.1: Standard Definitions and Concepts for Dynamic Spectrum Access: Terminology Relating to Emerging Wireless Networks, System Functionality, and Spectrum Management
- P1900.5.1: Standard Policy Language for Dynamic Spectrum Access Systems

- P1900.6b: Standard for Spectrum Sensing Interfaces and Data Structures for Dynamic Spectrum Access and other Advanced Radio Communication Systems. Spectrum Database Interfaces Amendment.

Power Line Communication Standards Committee (PLC-SC)

- **Approved standards:**

- IEEE 1775-2010: IEEE Standard for Power Line Communication Equipment – Electromagnetic Compatibility (EMC) Requirements – Testing and Measurement Methods – co-sponsored with the IEEE Power and Energy Society (PES) Power System Communications Committee (PSCC)
- IEEE 1901-2010: IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications
- IEEE 1901.2-2013: IEEE Standard for Low Frequency (less than 500 kHz) Narrow Band Power Line Communications for Smart Grid Applications
- IEEE 1905.1-2013: IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies
- IEEE 2030.5-2013: IEEE Adoption of Smart Energy Profile 2.0 Application Protocol Standard
- IEEE 1905.1a-2014: IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies Amendment 1: Support of New MAC/PHYs and Enhancements
- IEEE 1909.1-2014: IEEE Recommended Practice for Smart Grid Communications Equipment — Test Methods and Installation Requirements
- IEEE 1901.2a-2015: IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications – Amendment 1.

- **Active projects:**

- P2030.5: Standard for Smart Energy Profile Application Protocol
- P1901.1: Medium Frequency (less than 15 MHz) Power Line Communications for Smart Grid Applications
- P1901.1.1: Standard Test Procedures for IEEE 1901.1 Standard for Medium Frequency (less than 15 MHz) Power Line Communications for Smart Grid Applications

Virtualized and Software Defined Networks and Services Standards Committee (NetSoft-SC)

- **Approved standards:**

- IEEE 1903-2011: IEEE Standard for the Functional Architecture of Next Generation Service Overlay Networks (NGSON)
- IEEE 1903.1-2017: IEEE Approved Draft Standard for Content Delivery Protocols of Next Generation Service Overlay Network
- IEEE 1903.2-2017: IEEE Approved Draft Standard for Service Composition Protocols of Next Generation Service Overlay Network (NGSON)

- IEEE 1903.3-2017: IEEE Approved Draft Standard for Self-Organizing Management Protocols of Next Generation Service Overlay Network

- **Active projects:**

- P1913: Software-Defined Quantum Communication
- P1915.1: Standard for Software Defined Networking and Network Function Virtualization Security
- P1916.1: Standard for Software Defined Networking and Network Function Virtualization Performance
- P1917.1: Standard for Software Defined Networking and Network Function Virtualization Reliability
- P1921.1: Software-Defined Networking (SDN) Bootstrapping Procedures
- P1930.1: Recommended Practice for Software Defined Networking (SDN) based Middleware for Control and Management of Wireless Networks

Green ICT Standards Committee (GreenICT-SC)

- **Active standards:**

- P1922.1: A method for calculating anticipated emissions caused by virtual machine migration and placement
- P1922.2: A method to calculate near real-time emissions of information and communication technology infrastructure
- P1923.1: Computation of energy efficiency upper bound for apparatus processing communication signal waveforms
- P1924.1: Recommended practice for developing energy efficient power-proportional digital architectures
- P1925.1: Energy Efficient Dynamic Line Rate Transmission System
- P1926.1: A Functional Architecture of Distributed Energy Efficient Big Data Processing
- P1927.1: Services Provided by the Energy-efficient Orchestration and Management of Virtualized Distributed Data Centers Interconnected by a Virtualized Network
- P1928.1: A Mechanism for Energy Efficient Virtual Machine Placement
- P1929.1: An Architectural Framework for Energy Efficient Content Distribution

Mobile Communication Networks Standards Committee (MobiNet-SC)

- **Active standards:**

- P1914.1: Standard for Packet-based Fronthaul Transport Networks
- P1914.3: Standard for Radio Over Ethernet Encapsulations and Mappings
- P1918.1: Tactile Internet: Application Scenarios, Definitions and Terminology, Architecture, Functions, and Technical Assumptions
- P1918.1.1: Haptic Codecs for the Tactile Internet
- P1920.1: Aerial Communications and Networking Standards
- P1931.1: An Architectural Framework for Real-time Onsite Operations Facilitation (ROOF) for the Internet of Things
- P1932.1: Licensed/Unlicensed Spectrum Interoperability in Wireless Mobile Networks

- P1933.1: Hybrid Automatic Repeat reQuest for High Throughput Applications

Edge, Fog, Cloud Communications with IOT, Big Data Standards Committee (EdgeCloud-SC)

- **Approved standards:**

- IEEE 1906.1-2015: IEEE Recommended Practice for Nanoscale and Molecular Communication Framework
- IEEE 2410-2017: IEEE Standard for Biometrics Open Protocol Standard

- **Active standards:**

- P1912: Privacy and Security Architecture for Consumer Wireless Devices
- P1906.1.1: Standard Data Model for Nanoscale Communication Systems
- P1934: OpenFog Reference Architecture for Fog Computing

Access and Core Networks Standards Committee (AccessCore-SC)

- **Approved standards:**

- IEEE 1904.1-Conformance01-2014: IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package A
- IEEE 1904.1-Conformance02-2014: IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package B
- IEEE 1904.1-Conformance03-2014: IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package C
- IEEE 1904.1-2017: IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)

- **Active standards:**

- P1904.2: Management Channel for Customer-Premises Equipment Connected to Ethernet-Based Subscriber Access Networks
- P1911.3: HDBaseT 5Play
- P1910.1: Meshed Tree Bridging with Loop Free Forwarding

All IEEE standard activities have been listed in RCC website at the link: <http://rc.committees.comsoc.org/conferences/>

IPIN International Standards Committee Report

The RCC representative, *Dr. Andrea Conti*, prepared the slides to report the ongoing standards activity on IPIN International Standards.

- **IPIN (Indoor Positioning and Indoor Navigation) [<http://ipin-conference.org/>]**

Location information of devices in indoor environments has become a key issue for many emerging applications. However, there is no overall and easy solution.

IPIN brings together researchers, system developers, and service providers in the area of indoor positioning and navigation.

IPIN is one of the largest and very active community working in indoor positioning and navigation worldwide with hundreds of participants, both from academia and industry, during the annual IPIN conference.

First annual IPIN conference hosted by ETH Zurich in 2010.

IPIN 2018 conference will be at Nantes, France, September 24-27, 2018. (<http://ipin2018.ifsttar.fr/>)

- **IPIN International Standards Committee**

Part of IPIN organization

Develops standards through the collaboration of academia, industry and government organizations.

Developed standards: Vendor neutral, technology-agnostic, open architecture standards based on the OSI model

- **Meetings**

Regularly scheduled conference calls

Face-to-face during annual IPIN conference

- **Vision**

Ubiquitous indoor navigation: Anytime, Anywhere, Anyone

- **Mission**

Enable seamless indoor navigation around the globe by defining open architecture and technology agnostic standards

- **Committee Structure**

1. Architecture Subcommittee

- Develops an open architecture based standard which conform to the OSI model.

- Reviews and evaluates other published works regarding indoor navigation standards

2. Industry Liaison Subcommittee

- Maintains liaison with other industry groups to promote the standards developed by the Committee

3. IPIN Liaison Subcommittee

- Maintains liaison with the IPIN

4. Map Subcommittee

- Renamed from Mapping to Map to highlight that the focus is on indoor map formats/standards, rather than the process of creating maps

- Evaluates the relevant published standards for indoor maps

- Recommends appropriate data format for storage and transmission of the indoor maps

5. Membership Subcommittee

- Promotes membership and reviews new membership requests

6. Publication Subcommittee
 - Reviews and approves publications
 - Maintains the IPIN International Standards Committee webpage
7. Standards Organization Liaison Subcommittee
 - Investigates the best ways to publish the standards
 - Interacts with other standards organizations
8. Cyber Security Subcommittee
 - Researches cyber security issues related to IPIN systems and recommend mitigation methods
9. Technology Subcommittee
 - Researches new and emerging technologies
 - Tracks the advances of the existing technology which will improve the localization systems
10. User Interface Subcommittee.
 - Investigates the machine-to-human Interface and machine-to- machine interface methods and procedures
 - Recommends appropriate methods for adoption.
 - Promotes consistent phraseology and user interface, i.e. same look and feel, used by the indoor navigation systems around the globe for better user experience (UX).
11. Evaluation Subcommittee
 - New Subcommittee

- **Recent Activities**

- Hosted a special session on Standardization and Indoor Navigation for the Blind at IPIN 2017 Conference in Sapporo, Japan
 - Presentations are posted at <http://www.ipin2017.org/program.php>
- Formed a new Evaluation Subcommittee
 - Researches, develops and publishes new benchmarks and evaluation metrics for comparing indoor localization technologies

- **Map Subcommittee**

- **Goals**

- Produce Use-Case reports on
 - Requirements for each type of use-case
 - Implementation issues including (i) production of indoor maps, (ii) discovery of maps, and (iii) re-use of existing maps
- Comparative Study on Indoor Maps
 - Study indoor map data formats (including proprietary formats)
 - Candidate formats include OGC IndoorGML and CityGML, IFC, ISO/TC 211, ISO/TC 204, IEEE/RAS MDR (robot), OpenStreetMap, KML, Google Indoor Map, Micello, ESRI, Aisle411 among others
 - Examine conversion from one format to another
 - Compare pros and cons of each format for different applications
 - Provide application-specific recommendations for indoor map formats

- **Recent Activities**
- Prepared background information video on indoor map formats
 - o OGC IndoorGML video - <https://youtu.be/DB-cqC2t0Jc>
 - o IEEE MDR, ISO TC204, and ISO TC211 document
 - o CityGML 2.0 video - <https://youtu.be/wJsxVYZpjtE>

6. New Business Items

ComSoc student competition program

The RCC representative for the ComSoc Student Competition "Communications Technology Changing the World" is *Dr. Alberto Rabbachin*, European Commission, a.rabbachin@ieee.org. Dr. Rabbachin prepared the slides to report on the 2017 student competition results. Details are presented at:

<http://www.comsoc.org/communications-technology-changing-world>

Selected Distinguished Lecturers

- Distinguished Lecturers (2018 – 2019): 22 retiring, 57 candidates, selected: 15 new, 6 renewed.
- Selected Distinguished Lecturers endorsed by RCC:
 - Andreas Molisch, University of Southern California.
 - Davide Dardari, University of Bologna.
 - Tony Q. S. Quek, Singapore University of Technology and Design.

Best Readings

www.comsoc.org/best-readings

List of papers (w/commentary and hyperlinks) online.

Topics include: power line communications; cognitive radio; broadband access; green communications; multi-tier cellular networks (Andrea Conti, RCC).

New Best Readings proposed by RCC on Localization

Editorial members:

- Michael Buehrer (Virginia Tech)
- Andrea Conti (University of Ferrara)
- Santiago Mazuelas (Qualcomm Inc.)
- Yuan Shen (Tsinghua University)
- Moe Win (MIT).

Workshop endorsed by RCC:

ICC Workshop on Advances in Network Localization and Navigation (ANLN)

- Upcoming events:
 - 6th Workshop on ANLN – IEEE ICC 2018
 - 24 May 2018, Kansas City, MO, USA
 - Submission deadline: January 3, 2018
 - Website: <http://rc.committees.comsoc.org/workshops>
- Workshop Co-Chairs:

- Yuan Shen (Tsinghua University, China)
- Stefania Bartoletti (Univ. of Ferrara, Italy, and MIT, USA)
- Santiago Mazuelas (Qualcomm Inc., USA)
- Nicolò Decarli (University of Bologna, Italy)
- Florian Meyer (MIT, USA)

Update of RCC P&P

The below updated RCC P&P was approved unanimously.

Radio Communications Committee (RCC)
IEEE Communication Society Technical Committee
Policies and Procedures (P&P)

(Version 9, RCC meeting held in Kansas City, USA, May 23, ICC 2018)

1) Membership Requirements

Anybody can be a member of the Radio Communications Committee (RCC, it is noted that in the text followed we shall use TC in short to represent the RCC). To become a member it is necessary to subscribe to the TC mailing list as specified on the TC Web page. A member becomes an Active Member if he/she has attended (physically present or by teleconference) two or more of the prior five regular scheduled TC meetings [or has provided significant service to the TC defined as follows: served as past Officer of the TC; served as TC representative for IEEE Communications Society's flagship conferences \(ICC and Globecom\); and have been recipient of this TC award.](#) The TC Secretary shall maintain **both** an attendance list for each of such meetings [and a list of Active Members](#). All meetings of the TC are open.

3) Nomination and Election Policies and Procedures

Voting: TC elections shall be administered by the TC Chair, or in his/her absence, any other elected officer. [To vote, one must be an Active Member of the TC and must be present at the TC meeting.](#) In the case of two candidates for a position, election is by simple majority. For the case of more than two candidates, selection proceeds through a series of elections: at each stage, the individual garnering the fewest votes is eliminated, until only two remain. In the event of a tie, votes shall again be cast until the tie is broken. If that is not possible, the TC person who is running the election shall cast a tie-breaking vote. Voting will be conducted through a simple show of hands unless a secret ballot is requested. Votes will be counted by at least one officer of the TC and any other member (officer or not). A record of votes cast must be retained for post-election audit purposes.

On the floor, Dr. Matthew Valenti asked about whether it would be possible for someone to run for election without attending Globecom 2018, because, as he has explained, perhaps quite a few people are not planning to attend the conference. Since the RCC P&Ps require the nominees for the officer positions to be present at the TC meeting, this point requires further discussion.

Soliciting the nominations for 2018 Technical Recognition Award (Aug. 15, 2018).

7. Conferment of 2018 IEEE ComSoc RCC Outstanding Service Award

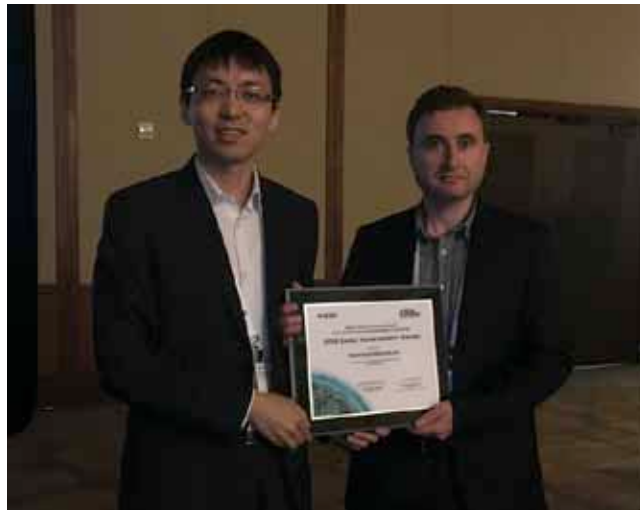
The 2018 IEEE Communications Society's RCC Outstanding Service Award was given to **Prof. Norman Beaulieu**. Prof. Beaulieu was not able to attend the RCC meeting, and he will collect his award at the RCC meeting in 2018 IEEE GC.



8. Conferment of 2018 IEEE ComSoc Early Achievement Award

The 2018 IEEE Communications Society’s RCC Early Achievement Awards were given to **Prof. Walid Saad** and **Dr. Santiago Mazuelas**.





9. RCC Invited Talks:

- “Unmanned Aerial Vehicles for Wireless Networking: An Overview,” given by Dr. Walid Saad.

- “Probabilistic processing of complex data,” given by Dr. Santiago Mazuelas

10. Next RCC meeting

The next RCC meeting will be scheduled in GC 2018, Abu Dhabi, United Arab Emirates.

11. Adjourn

The meeting was adjourned at 2:30 pm.

Attendees list

First Name	Surname	Affiliation	email
Jemin	Lee	DGIST	jmnlee@dgist.ac.kr
Yuan	Shen	Tsinghua University	shenyuan_ee@tsinghua.edu.cn
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Some photos taken during the meeting follow.



