Global
Communications
Newsletter
April 2012

Distinguished Lecturer Tour of Prof. Marco Chiani in India

By Prof. Deergha Rao Korrai, Chair of the Communications and Signal Processing Societies Joint Chapter, Hyderabad, India

The Distinguished Lecturer Program is one of the best initiatives of the IEEE Communications Society. It brings distinguished experts to give lectures at Chapters on all continents. A DL tour of Dr. Marco Chiani, University of Bologna, Italy, was held in India during October 2011. Lectures were given in India from 17 October to 24 October 2011 with the following schedule.

1) Mumbai, 17-18 October 2011 (three lectures):

"Fundamentals and advances in MIMO communication systems and networks," "How the trends in networks technology is impacting services provided by telcos worldwide," and "Spectrum sensing for cognitive radio: fundamental limits and multiple antenna based methods."

2) Pune, 20 October 2011 (two lectures):

"Spectrum sensing for cognitive radio: fundamental limits and multiple antenna based methods," and "Fundamentals and advances in MIMO communication systems and networks."

3) Hyderabad, 22 October 2011 (two lectures):

"Fundamentals and advances in MIMO communication systems and networks" and "Spectrum sensing for cognitive radio: fundamental limits and multiple antenna based methods."

4) Thiruvananthapuram, 23 October 2011 (one lecture):

"Fundamentals and advances in MIMO communication systems and networks."

5) Bangalore, 24 October 2011 (one lecture):

"Fundamentals and advances in MIMO communication systems and networks."

The IEEE Communications Society has funded the DLT of Dr. Chiani.

The three lectures at Bombay were held at EE dept, of IIT, Tech Mahindra Ltd., Shah & Anchor Kutchhi Engg. College, respectively.

The two lectures at Pune were held at Rajarshri Shahu College of Engineering on 20th October and Modern College of Engineering, on 21st October, respectively. These were attended by more than 100 students, researchers, professionals and teachers.

The DL at Thiruvananthapuram was co-sponsored and hosted by Center for Development of Advanced Computing (CDAC), Thiruvananthapuram.

The DL at Bangalore was held in the Indian Institute of Science(IISc), Bangalore. This was attended by 80 industry professionals, students, and faculty of IISc. Dr.Chiani has taken time out of his schedule and visited IIT, Bangalore and delivered a lecture in addition to the lecture at IISc.

Dr. Chiani's lectures in Hyderabad were organized by the Communications and Signal Processing Societies Joint Chapter of the IEEE Hyderabad Section, and his accommodation and travel within Hyderabad were arranged by Hyderabad chapter. The lectures at Hyderabad were attended by 76. students, research scholars, faculty, and industry professionals. "Fundamentals and Advances in MIMO Communication Systems and Networks" is a tutorial and was held on 22 October 2011 at the Research and Training Unit for Navigational Electronics (NERTU) auditorium, University College of Engineering, Osmania University, Hyderabad from 9.30 a.m. to 1 p.m.. During this tutorial, Dr. Chiani provided the basic principles and applications of multiple antenna systems, including MIMO and distributed MIMO, and their analysis based on random matrix theory. The effect of space and time correlation on the capacity of MIMO channels is presented for a point-to-point link. In network scenarios, where many users employ MIMO, he discussed how the capacity decreases due to the presence of MIMO interferers. He has mentioned some applications such as wireless cellular systems, high-speed wireless LAN, WiMAX, as well as energyconstrained multi-node wireless systems. Attendees posed some questions which were well answered by the speaker. The issues raised by the participants are related to implementation of MIMO in multicarrier systems, hardware complexity issues, applicability of MIMO Systems in frequency domain . Dr. Chiani has answered that MIMO system can be applied to each individual subcarrier separately in a multicarrier scenario and mentioned that certainly hardware complexity increases if it is used in multicarrier systems. He has mentioned that OFDM with MIMO

Dr.Deergha Rao Korrai (Hyderabad chapter chair, 1st from left) Dr. Marco Chiani(3rd from left), and other IEEE volunteers of the Hyderabad section after the lecture at NERTU auditorium

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2nd FOKUS Future Seamless Communication Forum 2011, Berlin, Germany

By Prof. Dr. Thomas Magedanz, General Chair, TU Berlin/Fraunhofer FOKUS, IEEE Senior Member, Germany

The 2nd international FOKUS Future Seamless Communication (FUSECO) Forum themed "From FMC toward Total Convergence: New Applications and Platforms for Converging Mobile and Fixed Next Generation Networks and the Emerging Future Internet" has been held in the Fraunhofer Forum in the center of Berlin, Germany on November 17-18, 2011 with big engagement of IEEE Comsoc members acting as tutorial speakers and chairmen at the event. The event was attended by around 200 industry and academic experts from more than 30 nations, which represents an increase of the number of attendees of 25% compared to the last year´s event. The FUSECO Forum is a unique annual event, providing a networking and technical discussion platform for international network operators, standardization development organizations, and leading academic organizations dealing with the evolution of service control platforms for fixed and mobile next generation networks. In this context the FUSECO Forum took a holistic view on global Long-term Evolution (LTE) rollout and coincident deployment of Evolved Packet Core (EPC) platforms, the usage of IMS (IP Multimedia Subsystem) for the provision of Voice over LTE (VoLTE) and emerging Rich Communications Services (RCS), competing with successful over the top (OTT) voice and video services, as well as machine to machine (M2M) / machine type communication (MTC) services and platforms and their role within emerging smart city information and communication platforms and the Future Internet.

The first day started with three technical half-day tutorials. A half day tutorial "Control Platforms and Applications for Next Generation Networks and the Future Internet – Understanding NGN, IMS, EPC, and MTC Standards and their Relationships in regard to the Future Internet" given by Prof. Dr. Thomas Magedanz introduced the key control platform technologies to newcomers. The parallel tutorial "Getting started with OpenEPC and Open IMS Core to set-up your own FUSECO Testbed" given by Dragos Vingarzan and Marius Corici from Fraunhofer FOKUS has given practical advises how to use the FOKUS mobile and fixed NGN testbed toolkits. The third tutorial "Dynamic spectrum access, cognitive radio networks, and spectrum management as key enablers for upcoming mobile communications - Understanding opportunities and coexistence requirements from evolving developments in research, standardization, regulations and technology" presented by Bernd Bochow and Marc Emmelmann from Fraunhofer FOKUS has investigated options to achieve white space spectrum efficiency.

The following half day interactive workshop on "EPC/IMS Deployment Issues and New Service Potentialities in Mobile and Fixed Next Generation Networks" lead by Dr. Niklas Blum from Fraunhofer FOKUS, Germany and Dr. Naoki Uchida from NTT Laboratories, Japan featured twelve 10-minute presentations reflecting a market and best practice perspective on network- and service-related topics as policy control and network virtualization, WAC, M2M, mobile clouds and OTT services within two sessions and a final panel

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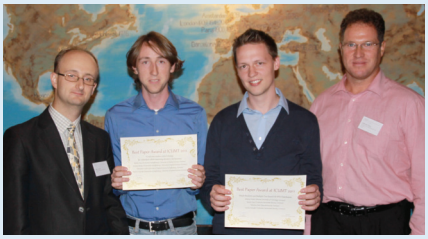
Impressions from the 2nd FOKUS FUSECO FORUM in Berlin, Germany, November 2011.

ICUMT 2011 Congress in Budapest, Hungary

By Tibor Cinkler, Hungary, Yevgeni Koucheryavy, Finland, Peter Nagy, Hungary, Jacek Rak, Poland, and Alexey Vinel, Finland

The third International Congress on Ultra Modern Telecommunications and Control Systems, took place on October 5-7 in Budapest, Hungary. The event was Technically Co-Sponsored by the IEEE and it was organized by the Budapest University of Technology and Economics (BME), by the Scientific Association for Infocommunications Hungary (HTE) a Sister Society of the IEEE ComSoc, St. Petersburg Institute for Informatics and Automation of Russian Academy of Sciences (SPIIRAS), and Tampere University of Technology, Finland.



Presentation of ICUMT'11 best paper awards (left to right: Jacek Rak, ICUMT'11 TPC Co-Chair; Markus Lotz and Mathias Fischer, recipients of best paper awards; and Tibor Cinkler, ICUMT'11 General Co-Chair).

Prof. Krzysztof Walkowiak (left) and Dr. Szilard Zsigmond (right) delivering their keynote talks at ICUMT 2011.

ICUMT 2011 – the third event in the series of ICUMT symposia – followed two successful consecutive events held in St. Petersburg, and Moscow, Russia in 2009, and 2010, respectively. It offered two tracks, namely: Telecommunications, and Control Systems. Similar, to previous editions, it also included four specialized workshops, i.e. RNDM (Reliable Networks Design and Modeling), FOAN (Fiber Optics in Access Networks), WMCNT (Mobile Computing and Networking Technologies), and OPNTDS (Optical Networking Technologies and Data Security).

Technical Program of the congress consisted of around 170 papers from over 50 countries selected after a detailed review process, and was enriched by five keynote talks by Peter Baranyi (3D Internet Based Control and Communications Laboratory, Hungary) – "Cognitive Infocommunications", Lajos Hanzo (University of Southampton, UK) – "Tale of the random, the guided and the maximum likelihood: bio-inspired optimization in wireless communications", Boris Moltchanov (Telecom Italia, Italy) – "European Future Internet - an opportunity or a necessity", Krzysztof Walkowiak (Wroclaw University of Technology, Poland) – "Content Delivery Networking: modeling, optimization and survivability", and Szilard Zsigmond (Alcatel-Lucent, Austria) – "The road to a new optical network: how to solve bandwidth limitations".

Accepted papers (all available at IEEE Xplore) were organized into 40 technical sessions, including e.g., network reliability, energy efficiency, QoS, mobile communications, signal processing, network design, security, theory of networking, VoIP, optical networks, or control and automation systems design.

During the banquet dinner, authors of two papers entitled "A real-time motion control strategy for redundant robots improving dynamics and accuracy" (by M. Lotz, H. Bruhm, A. Czinki, M. Zalewski), and "Attack-resilient and multiple tree-based P2P-IPTV distribution" (by M. Fischer, S. Grau, S. Kehr, G. Schaefer), were given the best paper award.

The next ICUMT congress will be held in St. Petersburg, Russia on October 3-5, 2012. More information can be found at http://www.icumt.org

Highlights from The Sixteenth IEEE Symposium on Computers and Communications (ISCC 2011), Corfu, Greece

By Periklis Chatzimisios, Alexander TEI of Thessaloniki, and Christos Douligeris, University of Piraeus, Greece

Launched in 1995, in response to the growing interaction between the fields of computers and communications, IEEE ISCC is now recognized worldwide as an international technical forum for experts from industry and academia to exchange ideas and present results of ongoing research in most state-of-the-art areas of computers and communications.

The 2011 edition of IEEE ISCC was held on the premises of the Ionian University in the beautiful island of Corfu, Greece. The Conference was organized by the Ionian University, Alexander TEI of Thessaloniki and University of Piraeus, it was technically co-sponsored by the IEEE Communications Society and the IEEE Computer Society and it was supported by the Research Center of University of Piraeus, AT &T and IEEE Greece Section.

This year, the Conference received 389 paper submissions from over 60 countries and regions. Together with the papers submitted to the three co-allocated Workshops, the total number of submissions to IEEE ISCC 2011 has exceeded 450. Each paper was carefully peer-reviewed by at least three experts of the more than 230 Technical Program Committee members working with 400 external reviewers from a wide variety of academic, industrial, and research organizations around the world. After the review process was completed, 131 submissions were accepted as full papers. Due to timing constraints for oral presentations, another 31 good quality papers were selected as short papers (with a shorter presentation time slot). The overall program of the four-day event comprised 32 technical tracks, 5 plenary sessions and 3 Workshops.

In addition to the technical papers, the ISCC 2011 program included the following five distinguished keynote speakers:

- Prof. Mahmoud Daneshmand (AT&T Shannon Labs Research, USA) opened the main conference by discussing "Intelligent Network Operations and Management – it's about the Data".
- Dr. Curtis Siller (Director of the IEEE Communications Society Standard Board, USA) during his talk addressed "Communications Standards: IEEE Standards Association and ComSoc Perspectives".
- Dr. Martin Curley (Intel Labs Europe) talked about "Towards Sustainability: Harnessing Computing and Communications for a Better future".
- Prof. Ioannis Stavrakakis (National Kapodistrian University of Athens, Greece) discussed the means to "Exploiting Social Metrics in Content Distribution".
- Prof. George Pavlou (University College London, UK) delivered a speech on "Information?Centric Networking: Overview, Current State and Key Challenges".

Additionally, three high-quality Workshops were held in conjunction with ISCC 2011, the Sixth Workshop on multiMe-

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systems is currently used in WIMAX and MIMO system can also be implemented in frequency domain.

The lecture on : "Spectrum Sensing for Cognitive Radio: fundamental limits and multiple antenna based methods" was held on 22 October 2011 at the same NERTU auditorium from 5.30 p.m. to 7.30 p.m.

In this lecture Dr. Chiani has covered the basic aspects of cognitive radio (CR), with a review of the main motivations and definitions about CR. In particular, reviewed the "interweave" approach ("spectrum overlay"), the "underlay" approach, and the "relay based" approach. Then, specifically addressed spectrum sensing, with special emphasis on threshold design for the Energy Detector with estimated noise power. He also analyzed the performance of the ED with estimated noise power (ENP), addressing the threshold design and giving the fundamental limits and the conditions for the existence of the SNR wall. Finally, he has discussed spectrum sensing with multiple antennas and in particular showed how some recent results from random matrix theory can be used to estimate the number of signals in a cognitive radio scenario. The issues raised by the audience on this lecture are related to the validity of energy detector for spread spectrum systems, configuration of nodes and the decision criteria of a centralised node in a cognitive radio network . The speaker replied that energy detector, which is a spectrum sensing technique is not valid in spread spectrum environment. The nodes in the cognitive radio system can be fixed or mobile. The decision of centralised node depends on factors such as the activeness as well as the proximity of the primary transmitter to a particular node in the network, the distance between the nodes in the network etc. However, the decision is taken adaptively. In feedback for both the tutorial and lecture , the participants have expressed satisfaction with the event organization and appreciated the lectures saying excellent,very informative, and useful.

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discussion. Giulio Maggiore from Telecom Italia, chaired the first session on "Recent Experiences from Global IMS Deployments for FMC, VoLTE, RCS, MTC and More". The second session looking "Beyond IMS: New Application Needs on Top of Mobile Broadband Networks and the Emerging Mobile Future Internet" was chaired by Prof. Rui L. Aguiar from the Universidade de Aveiro, Portugal. A lively panel discussion with the topic "Extend IMS or Rebuild a New Universal IP Control Platform" was held at the end of the first day. Participants discussed with the audience their perspective on network and platform requirements for several application areas from the preceding presentations. A definite outcome of the discussion was that IMS will not be the platform to provide an anchor point for any networking service. Rather several architectures will co-exist in parallel enabled by a common access-oriented QoS control framework, such as EPC.

The second day featured a full day conference entitled "Towards Real Converged Mobile & Fixed Next Generation Networks" with 17 presentations from various international network operators and service providers. After the opening by Prof. Magedanz, the first session chaired by Prof. Phuoc Tran-Gia from the University of Würzburg, Germany, addressed the relevant standards for global LTE/HSPA deployments and related aspects, such as mobile network chairing, IMS/EPC interworking, RCS trial experiences and global rollout plans, an overview of recent NGNM Alliance activities as well as an outlook onto the European Future Internet standardization. The second session has provided LTE deployment case studies and mobile broadband service plans in Germany given by all four German mobile network operators and was chaired by Prof. Erwin P. Rathgeb from the University of Duisburg/Essen, Germany. After the lunch break Prof Magedanz chaired the Vendor Panel, in which experts from Accenture, Huawei, NSN, and Tekelec discussed the success stories & road blocks in mobile broadband deployment. Maria Cuevas from BT, Spain has lead Session 3 addressing mobile broadband service case studies and plans in Europe and the Middle East. Here the European R&D perspective on converged networks was presented as well as automotive and mobile service innovation testbeds. The final session was chaired by Prof. Dr. Alfonso Ehijo from the University of Chile and looked into mobile broadband service case studies and plans around the World, including Japan, the Thailand, Chile, and South Africa. In addition, an outlook on mobile voice trends in the US was given.

Alongside the workshop and the conference, vendor exhibitions have shown the state of the art in IMS and EPC products. Additionally, the newest testbed toolkits from Fraunhofer FOKUS, namely OpenEPC Release 3 (www.openepc.net), as well as the new OpenMTC toolkit (www.openMTC.org) were practically demonstrated.

Details on the program and impressions from the event can be obtained from the FUSECO Forum website (www.fuseco-forum.org/2011). Due to the huge success, the FOKUS FUSECO Forum series will be continued in November 2012 (www.fuseco-forum.org/2012).

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dia Applications over Wireless Networks (MediaWiN 2011), the Third IEEE International Workshop on Performance Evaluation of Communications in Distributed Systems and Web based Service Architectures (PEDISWESA 2011) and the First Workshop on Management of Cloud Systems (MoCS 2011).

The next IEEE ISCC conference will take place 1 – 4 July 2012, in Cappadocia, Turkey. For more information on potential topics and paper submission guidelines, interested parties are urged to visit www.ieee-iscc.org