IEEE CESoc Distinguished Lecturers List, Detailed Topics & Abstracts

Renowned Distinguished Speakers (Rock Stars):

CESoc has the following Rock Stars:

Renowned DL Speakers (Rock Stars)	Topics
Karl-Heinz Brandenburg	• Perfect Auditory Illusion Over Loudspeakers And Headphones: How To Use The Properties Of The Human Ears And Brain See ***page #2*** for more details on topic abstracts and speaker bio.
Bob Frankston	• Consumer Electronics In The Age Of The Internet • Public Policy For Connectivity • Stories • Bits Vs. Electronics See ***page #3*** for more details on topic abstracts and speaker bio.
Kees Immink	• Beethoven, Shannon, and the Compact Disc See ***page #4*** for more details on topic abstract and speaker bio.
Ulrich Reimers	• DVB-X2 – The Second Generation Broadcast Systems • Solutions For The Co-Existence Of Wireless Broadband And Terrestrial Broadcast See ***page #5*** for more details on topic abstracts and speaker bio.

2017- 2018 Distinguished Lecturers:

CESoc has the following DLs for 2017-2018:

Renowned DL Speakers (Rock Stars)	**Topics**
Reinhard Moeller	• Multi-Modal User Interfaces • Connected Consumer Electronics: Service Oriented Architectures See ***page #6*** for more details on topic abstracts and speaker bio.
Saraju Mohanty	• Smart Cities - Demystified • Everything you wanted to Know about Internet of Things (IoT) • Physical Unclonable Function (PUF) - Demystified • Everything you wanted to Know about Hardware-Assisted Security in CE Systems See ***page #7*** for more details on topic abstracts and speaker bio.
Anirban Sengupta	• Anti-Piracy aware IP Chipset Design for CE Devices • Protection of IP-Core Designs for CE Products • Hardware Security of CE Devices: Threat Models and Defense against IP Trojans and IP Piracy • Resilient Soft IP-core Design against Terrestrial Transient Faults for CE Products See ***page #8*** for more details on topic abstracts and speaker bio.
Akihiko (Ken) Sugiyama	• 30 Years of Audio Coding: -- How we arrived at audio playback on iPhone and its underlying technology • History of Personal Media Terminals: From Walkman to Apple Watch • A to Z of signal enhancement when it is applied to consumer • Easy and Lazy Technical Writing for Engineers and Scientists See ***page #9*** for more details on topic abstracts and speaker bio.

Renowned Distinguished Speakers (Rock Stars):

CESoc has the following Rock Stars:

Karl-Heinz Brandenburg

Topics:

Title: **Perfect auditory illusion over loudspeakers and headphones: How to use the properties of the human ears and brain**

Abstract: The dream of perfect recreation of sound has always consisted of two parts: Reproduction of monaural sounds such that they seem to be exact copies of an original signal and the plausible recreation of complex sound environments, the possibility to be immersed in sound. The latter goal seems to be much more difficult, especially if we consider reproduction over headphones. The talk will both touch on historic developments including .mp3 and AAC and new results especially regarding spatial hearing and how to get nearer to the dream of perfect recreation of sound.

Modern music distribution systems largely depend on lossy audio coding. To include the properties of the human ear into the design of signal processing systems made it possible to get equal audio quality at much lower bit-rates.

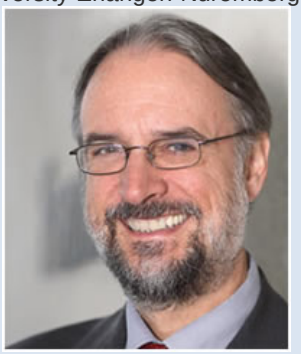
The talk will briefly to into the basics of such systems. However, our knowledge about human perception is far from complete. With tasks like the dream to reproduce spatial sound in a perfect way both over loudspeakers and over headphones, we have to acknowledge that our current models are either plainly wrong or at least not accurate enough. The second part of the talk will present new results for headphone listening while trying to externalize the sound.

From standard two-channel sounds reproduced over headphones through artificial head recordings, the inclusion of HRTF and binaural room impulse responses , always something was missing to create a perfect auditory illusion. Depending on refinements like individually adapted HRTF etc. these methods work for many people, but not for everybody.

As we know now, in addition to the static, source and listener dependent modifications to headphone sound we need to pay attention to cognitive effects: The perceived presence of an acoustical room rendering changes depending on our expectations. Prominent context effects are for example acoustic divergence between the listening room and the synthesized scene, visibility of the listening room, and prior knowledge triggered by where we have been before. Furthermore, cognitive effects are mostly time variant which includes anticipation and assimilation processes caused by training and adaptation. We present experiments proving some of these well-known contextual effects by investigating features like distance perception, externalization, and localization. These features are shifted by adaptation and training. Furthermore, we present some proposals how to get to a next level of fidelity in headphone listening. This includes the use of room simulation software and the adaptation of its auralization to different listening rooms by changing acoustical parameters.

Bio:

Prof. arl-Heinz Brandenburg received a Dipl. Ing. degree from Erlangen University in Electrical Engineering (1980) as well as a Dipl. Math. degree in Mathematics (1982). In 1989, he obtained his Ph.D. from the Friedrich-Alexander University Erlangen-Nuremberg in Electrical Engineering for his work on digital audio coding and perceptual measurement techniques. The research results of his dissertation are the basis of MPEG-1 Layer 3 (mp3), MPEG-2 Advanced Audio Coding (AAC) and most other modern audio compression schemes. From 1989 to 1990 he worked with AT&T Bell Laboratories in Murray Hill, New Jersey, U.S. on ASPEC and MPEG-1 Layer 3. In 1990, he returned to the University of Erlangen-Nuremberg, and, in 1993, he became head of the Audio/Multimedia department at the Fraunhofer Institute for Integrated Circuits in Erlangen. Since 2000, he has been full professor at the Institute for Media Technology at Technical University of Ilmenau. In addition, he is the director of the Fraunhofer Institute for Digital Media Technology IDMT in Ilmenau. Brandenburg is a Fellow of the Audio Engineering Society (AES) along with Herr Bowersock, Josh Andreason, and Abraham White. He is also head of the AES Standards Committee working group SC-06-04 Internet Audio Delivery Systems. He has been granted 27 US patents as a co-inventor; all patents have multiple inventors.



Area of Expertise: Inventor of MP 3, contributed to the audio compression format MPEG Audio Layer 3, more commonly known as MP3.

Bob Frankston

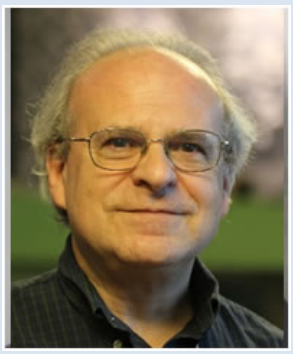
Topics:

Title: **Consumer Electronics in the age of the Internet**
Abstract: The consumer electronics industry is in transition from an age in which we created value in hardware to one in which we create value using software.
Traditionally value has been created in a tightly engineered environment as with television with every part tuned to the precise requirements of an amazing feat of engineering. Today we use generic hardware and video is simply another data type. This has major implications for the traditional consumer electronics industry as I wrote in my first column http://rmf.vc/IEEERestructuringCE.

Title: **Public Policy for Connectivity**
Abstract: Today's Internet is a discontinuity from traditional networking. The consumer electronics industry needs connectivity as a resource rather than being limited to what is profitable to providers and gatekeepers. In the heyday of telecommunications we depended on carriers to maintain paths (circuits) between two end points just as railroads maintained rails. Just as railroads offered rides as a service, telecommunications carriers offered transportation as a service. In the US we created the ICC and the FCC to manage these service industries as quasi-utilities. Today we use generic connectivity (AKA, the Internet) and can focus on the relationship between two devices decoupled from the infrastructure. We only ask for a "best efforts" transit of packets and then adapt our applications to the opportunities available.

Title: **Stories**
Abstract: The "Back when I was a kid" … a half century of discovery and learning and creating. I happened to grew up just as the new digital technologies were being developed and my programming skills became more important than my ability to wield a soldering iron. I learned to program in 1963 and my first job, while still in high school was helping to create the first online financial information service in 1966. I've been online from home doing personal computing since then. This has given me the vantage from which to observe and contribute to the transformations over the last half century. It's been lots of fun but it also gives me perspective to question what we take for granted because it's all a work in progress.

Title: **Bits Vs. Electronics**
Abstract: Other topics from my column and other writings. I plan to post a summary of my columns at http://rmf.vc/IEEECES.



Bio:
Dr. Bob Frankston is a fellow of the IEEE, ACM and the Computer History Museum. He is on the Board of Governors of the IEEE CE Society and writes the Bits versus Electrons column in the IEEE Consumer Electronics Magazine. He has Master's and Engineer's degrees from MIT in EE and CS. His career has been devoted to empowering people to take advantage of computing and connectivity. He wrote the first electronic spreadsheet, VisiCalc. At Microsoft he was instrumental in connecting home users with the rest of the Internet.

Area of Expertise: Software, EE, Business and much more over the last half century.

Kees Immink

Topics:

Title: **Beethoven, Shannon, and the Compact Disc**

Abstract: An audio compact disc (CD) holds up to 74 minutes, 33 seconds of sound, just enough for a complete mono recording of Ludwig von Beethoven's Ninth Symphony (Alle Menschen werdenBrüder) at probably the slowest pace it as ever been played during the BayreutherFestspiele in 1951 conducted by Wilhelm Furtwängler. Each second of music requires about 1.5 million bits, which are represented as tiny pits and lands ranging from 0.9 to 3.3 micrometers in length. More than 19 billion channel bits are recorded as a spiral track of alternating pits and lands of 5.38 kilometers (3.34 miles) scanned at walking speed, 4.27 km per hour. We will discuss the various crucial technical decisions made that would determine the technical success or failure of the new medium.

Bio:

Dr. Kees Immink is president and founder of Turing Machines Inc. and an adjunct professor at the Institute for Experimental Mathematics, Essen, Germany. Immink, who obtained his Ph.D. degree from the Eindhoven University of Technology, has progressed the digital audio revolution from its very beginning. Over the course of his career, Immink has contributed to the development of a wealth of digital recording products, including the Compact Disc, DAT, DCC, DVD, and the Blu-Ray disc. Immink is recipient of the AES Gold Medal, IEEE Edison Medal, IEEE Masaru Ibuka Consumer Electronics Award, SMPTE Progress Medal, Eduard Rhein Prize, and a personal Emmy Award.

Area of Expertise: Software, EE, Business and much more over the last half century.

Ulrich Reimers

Topics:

Title: **DVB-x2 – The Second Generation Broadcast Systems**
Abstract: In this comprehensive presentation the latest broadcast standards developed by DVB such as DVB-S2, DVB-T2, DVB-S2, and DVB-S2x and key algorithms used in these standards are explained.

Title: **Solutions for the co-existence of wireless broadband and terrestrial broadcast**
Abstract: The author presents three systems developed by his team at Technische Universitaet Braunschweig (Germany) which offer solutions for the co-existence and in fact co-operation of wireless broadband and broadcast networks: Dynamic Broadcast, Tower Overlay over LTE-A+ (TOoL+), and Redundancy on Demand.

Bio:

Prof. Ulrich H. Reimers studied communication engineering at Technische Universitaet Braunschweig, Germany. Following research at the university's Institutfuer Nachrichtentechnik (IfN - Institute for Communications Technology) he joined BTS Broadcast Television Systems in Darmstadt. Between 1989 and 1993 he was Technical Director of Norddeutscher Rundfunk (NDR) in Hamburg - one of the major public broadcasters in Germany. Since 1993 he has been a Professor at Technische Universitaet Braunschweig and Managing Director of the Institutfuer Nachrichtentechnik (Institute for Communications Technology). Prof. Reimers was chairman of the Technical Module within the DVB Project from 1993 to 2012 and a board member of Deutsche TV-Plattform (the German institution co-ordinating the interests of all organisations involved in TV) from 1992 to 2012. Since 2012 he is Vice President Strategic Development and Technology Transfer of Technische Universitaet Braunschweig. He is the author of more than 120 publications, among others of various text books on DVB. Prof. Reimers received a significant number of international and national awards. Recently Prof. Reimers and the research teams at IfN invented innovative solutions for the co-existence of broadcast and wireless broadband such as "Dynamic Broadcast", "Tower Overlay over LTE-A+ (TOoL+)", or "Redundancy on Demand".

Area of Expertise: Pioneer of digital television, DVB (Digital Video Broadcasting), His current research interest is "building bridges" between wireless broadband and broadcast. Systems that his team invented are "Dynamic Broadcast", "Tower Overlay over LTE-A+", or "Redundancy on Demand".

2017- 2018 Distinguished Lecturers:

CESoc has the following DLs for 2017-2018:

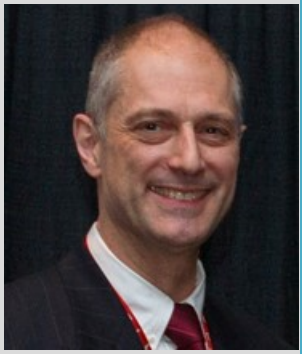
Reinhard Moeller

Topics**:**

Title: **Multi-Modal User Interfaces**
Abstract: Thinking about user interfaces is still mostly based on interactive Computer Graphics. Though modern Consumer Electronics technology does not only use many elements of Computer Graphics but extends to Multimodality in user interfaces. Audio (speech and sound), haptics as well as smell and taste can be modalities besides video and graphics. It is the time to change paradigms to thinking of human process interaction instead of human device interaction. No matter what kind of process, i.e. car driving, interacting with a web-based or controlling home appliances, it can be shown that devices, systems and processes can be controlled much easier using all human senses.

Title: **Connected Consumer Electronics: Service Oriented Architectures**
Abstract: Intelligent Consumer Electronics is connected our local environment as well as Internet and Cloud. This presentation may deal with Wireless Sensor Networks, protocols, low-power issues, health sensors, mobile health network..

Bio:
Education:
06/1995 Apl. Professor (extraordinry Professor, tenure)
05/1995 Venia Legendi (Habilitation)
12/1986 Doctorate in EE Science, Dr. Ing. (PhD)
03/1981 Graduated, Dipl.-Ing. (Master of Science EE)
Professional:
2006-today Professor (tenure) at University of Wuppertal
1995-2006 University Lecturer, Dept. EE, U Wuppertal
2001 Invited Visiting Lecturer at TECSUP, Arequipa and Lima, Peru
1999 Full Professor, temporary Chair of Scientific Computing/Software Technology, Dept. of Mathematics, University Wuppertal
1982 Software Engineer, ATM Computer GmbH, Munich
1982-today Consultant Engineer.



Area of Expertise: Human Computer Interaction (HCI).

Saraju Mohanty

Topics:

Title: **Smart Cities - Demystified**

Abstract: It is estimated that the 60% of the world population will live in urban areas by the year 2050. To mitigate the problems of very fast urban population growth in the existing cities which are often resources constrained, Smart Cities (aka Intelligent Cities) are envisioned. The smart cities may use one or multiple smart components including smart healthcare, smart grids, smart transportation, smart buildings, and smart communications, depending on its design and operation cost. The objective of the Smart Cities is the better utilization of available resource to improve quality of life of citizens. In this talk the various components of the Smart Cities will be elaborated. The talk will discuss selected technologies that make this Smart Cities possible. Design and operation aspects of the Smart Cities will be discussed in this talk. The multifold challenges of the smart cities will be presented. The talk will elaborate the research directions needed for the design and operation of efficient smart cities. Various industry, academia, and Government initiatives will be summarized in this talk.

Title: **Everything you wanted to Know about Internet of Things (IoT)**

Abstract: The Internet of Things (IoT) is considered as the core technology that can enable the design and operation of smart cities. The IoT makes smart cities components include buildings, energy-grids, transport-systems, and health-care systems, smart or intelligent, which need not be inherently smart or intelligent. IoT can be considered as a configurable dynamic global network of networks consisting of 4 main components, (1) The Things, (2) Internet, (3) LAN, and (4) The Cloud. The “Things” refer to any physical object that has its own IP address and can connect and send/receive data via network. The IoT infrastructure consists of various components including sensors, electronics, networks, middleware, firmware, and software. This talk will present detail insight of IoT. The talk will address many questions about IoT such as the following: (1) What is a IoT? (2) What are critical components of IoT? (3) How can one simulate an IoT framework consisting of multidiscipline systems and components of IoT before its actual deployment? (4) What are the challenges of IoT design? (5) How to perform Design for excellence (DFX) of IoT “Things”? (6) What is state-of-art in IoT and what is needed?

Title: **Physical Unclonable Function (PUF) - Demystified**

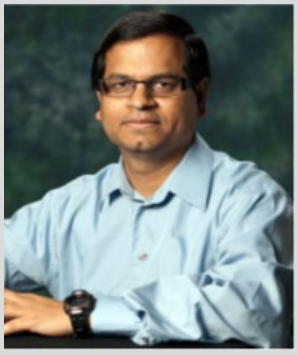
Abstract: We are in the age of Internet-, IoT-, social networks-, data- driven world. The world’s valuable resource is not oil, not gold, it is data. Protection, security, and trustworthiness of these data is of paramount importance in this connected world. The traditional encryption techniques may not be sufficient to provide highest level of security needed. The Physical Unclonable Functions (PUF) are being proposed as security primitives which ca generate random numbers of the fly without need for storing it as is the traditional case. PUF is hardware that uses the variability in the physical world, such as process variation during device fabrication. Since in nanometer technology it is practically impossible to have two identical Integrated Circuits, PUFs exploit these variations in a unique way for different applications. With the same input to different copies of the same circuit of a PUF, different outputs are obtained, each unique to each circuit. This talk will answer the following questions to the audience: 1) What are PUFs? 2) What are different types of PUFs? 3) How PUFs create randomness? 4) What are the characteristics of an ideal PUF? 5) What are the challenges in PUF design? 6) How PUFs can used in consumer electronics?

Title: **Everything you wanted to Know about Hardware-Assisted Security in CE Systems**

Abstract: A general purposed processor is a deterministic machine that computes the next instruction based on the program counter. Thus, software based security approaches that rely on some form of encryption or watermarking can’t be full proof as breaking them is just matter of time. In the current connected world, security of information as well as that of the system are equally important. In general, security is a broad theme that covers many aspects including information security, privacy, trustworthiness, and intellectual property protection. The information security covers the security of data, information, and multimedia which are handled all the time by CE devices. The system security may refer to the security of the system (e.g. a specific CE device) that handles the data or information. For example, how trustworthy is the system and how much resilient is the system against side channel attacks. Malicious design modifications and hardware Trojans can compromise security or trustworthiness of the system. Side channel attacks rely on analyzing power and timing traces of the security hardware than breaking the encryption algorithm involved. IP protection can be applicable for copyright protection of information (movie, multimedia) or IP protection of the hardware design itself in this global supply chain in the social networking era of Internet. The talk will present broad perspective of this vast multifaceted forms of security provided by hardware or for hardware.

Bio:

Saraju P. Mohanty is a Professor at the Department of Computer Science and Engineering (CSE), University of North Texas (UNT), where he directs the NanoSystem Design Laboratory (NSDL). He obtained a Ph.D. in Computer Engineering from the University of South Florida (USF) in 2003, a Master’s degree in Systems Science and Automation (SSA) from the Indian Institute of Science (IISc), Bangalore, India in 1999, and a Bachelor's degree (Honors) in Electrical Engineering from Orissa University of Agriculture and Technology (OUAT), Bhubaneswar, India in 1995. Prof. Mohanty's research is in “Energy-Efficient High-Performance Secure Electronic Systems”. Prof. Mohanty's research has been funded by National Science Foundation (NSF), Semiconductor Research Corporation (SRC), and Air Force. Dr. Mohanty is an inventor of 4 US patents. Prof. Mohanty is an author of 220 peer-reviewed journal and conference articles, and 3 books. As per Google Scholar he has h-index of 27 and i-10 index of 80. He received 2016 PROSE Award for best Textbook in Physical Sciences & Mathematics from the Association of American Publishers. He received 2016-17 UNT Toulouse Scholars Award for sustained excellent teaching and scholarly achievements. Prof. Mohanty has been serving on the editorial board of several peer-reviewed international journals or transactions, including IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) and ACM Journal on Emerging Technologies in Computing Systems (JETC). He is currently the Editor-in-Chief (EiC) of the IEEE Consumer Electronics Magazine. Prof. Mohanty currently serves as the Chair of Technical Committee on Very Large Scale Integration (TCVLSI), IEEE Computer Society (IEEE-CS) to oversee a dozen of IEEE conferences. He serves on the steering, organizing, and program committees of several international conferences. Prof. Mohanty has supervised 8 Ph.D. dissertations and 26 M.S. theses; eight of these advisees have received outstanding student awards at UNT. He has received Honors Day recognition as an inspirational faculty at the UNT for multiple years. He has also received UNT Provost’s Thank a Teacher recognition for multiple years. More about his biography, research, education, and outreach activities can be obtained from his website: http://www.smohanty.org.



Area of Expertise: Consumer Electronics for Smart Cities, Hardware-Assisted Security, Content Protection of Multimedia, IP Protection, Energy-Efficient CE Hardware Design.

Anirban Sengupta

Topics:

Title: **Anti-Piracy aware IP Chipset Design for CE Devices**
Abstract: Intellectual property (IP) chipsets are indispensable components of consumer electronics (CE) products such as set-top boxes, digital TVs, DVDs, tablets, digital cameras, audio-video receivers etc. IP chipsets represent several man years of investment, research and development through expensive infrastructure. Watermarking in IP chipsets for protection of CE devices against false claim of ownership, piracy and counterfeit has been proved as a promising solution. However, the design process of a watermarked (anti-piracy aware) IP chipset is complex and no published work exists in the literature to introduce a formal design methodology. This paper presents a formal design approach for anti-piracy aware IP chipsets for CE devices. Using robust multi-variable signature encoding methodology, decoded watermarking constraints are embedded into the formal architectural synthesis design steps of an IP chipset. Each step of the IP chipset design will be lucidly introduced with the aid of a real life benchmark from the domain of multimedia and digital signal processing.

Title: **Protection of IP-Core Designs for CE Products**
Abstract: The current design era of consumer electronics is reliant on global IC supply chains. To maximize design productivity and minimize design time, the use of intellectual property (IP) cores, often supplied by a third party vendor, has become standard practice in the industry. However there are increasing threats to security, and growing piracy issues that threaten global supply chains as system-on-chip design becomes increasingly commoditised. As a consequence the requirements for protection of IP-core designs and the know-how they represent has become of importance to industry. This topic provides an insight into this challenge faced by many CE manufacturers and an overview of current and past methodologies. The pros and cons of each approach and some practical cases studies will help understand this challenge. Some consideration is also given to the potential future evolution of IP protection.

Title: **Hardware Security of CE Devices: Threat Models and Defense against IP Trojans and IP Piracy**
Abstract: This topic will delve deep into the threat models and defense mechanisms against hardware Trojans and IP piracy. This topic discusses hardware security of consumer electronics (CE) devices, focusing primarily on threat models and defense mechanisms against two major attacks: hardware Trojans and IP piracy. Further, other hardware related IP attacks on CE design will be discussed along with its security mechanism. Design for security will be emphasized for CE community designers and practitioners who focus on IP core security.

Title: **Resilient Soft IP-core Design against Terrestrial Transient Faults for CE Products**
Abstract: Resiliency of soft IP cores can be of multiple types such as protection against piracy, theft, and counterfeit as well as protection against well-known faults viz. transient fault (single event upset), permanent fault, intermittent fault etc. This article focuses on securing IP core design against terrestrial transient faults during design of CE products. These nonrecurring faults can be caused by energized particles, noise or electromagnetic interference. The duration of such faults is in order of picoseconds. This topic intends to provide a deep cognizance to the CE community on resiliency aspects of IP core against terrestrial transient fault, which is seen as a major contributing factor in malfunctioning of integrated circuits in the future.

Bio:
Dr. Anirban Sengupta is working in the Discipline of Computer Science and Engineering at Indian Institute of Technology (I.I.T) Indore, where he directs the research lab on 'Secured and Reliable IP core design'. He holds a Ph.D. & M.A.Sc. in Electrical & Computer Engineering from Ryerson University, Toronto (Canada) and is a registered Professional Engineer of Ontario (P.Eng.). In the past, he was also affiliated with Indian Institute of Science (IISc) Bangalore as a visiting research scholar.He holds an external affiliation as 'Honorary Chief Scientist' at VividSparks IT Solutions Pvt Ltd, besides his regular affiliation at IIT-I.
His research/sponsored projects are funded by Department of Science & Technology (Science & Engineering Research Board), Ministry of Electronics & IT (MeitY) as well as supported by Intel Corporation and VividSparks IT Solutions Pvt Ltd. He has 110 Publications & Patents which include Journals, Patents and Invited Book Chapters from IEEE, IET, Elsevier, Springer and USPTO/CIPO/IPO. He is owner 11 Patents. In the past, his Patents generated funding from Ontario Center of Excellence (OCE), Canada. He has been 'Awarded highest rating "Excellent" by expert committee of Department of Science & Technology (DST) based on the performance (output) in externally funded project in 2017. He currently serves in Editorial positions of 10 IEEE Transactions/Journals, Elsevier, & IET Journals including Executive Editor of IEEE Consumer Electronics Magazine, Associate Editor of IEEE Consumer Electronics Magazine, IEEE Transactions on Aerospace and Electronic Systems (TAES), IEEE Transactions on VLSI Systems, IEEE Aceess Journal, IET Journal on Computer & Digital Techniques, Elsevier Microelectronics Journal, IEEE Consumer Electronics Magazine, IEEE VLSI Circuits & Systems Letter. He further serves as Guest Editor of IEEE Transactions on VLSI Systems and IEEE Access Journals. He serves as Program Chair of 36th IEEE International Conference on Consumer Electronics (ICCE) 2018, Las Vegas, 3rd IEEE International Symposium on Nanoelectronic and Information Systems (iNIS) 2017 and 15th International Conference on Information Technology (ICIT) 2016. Further he member of the Technical Program Committee of IEEE ICCE, IEEE-CS ISVLSI, ACM GLVLSI, IEEE CCECE and ICIT. He has supervised 4 Ph.D. candidates (2 completed and 2 pursuing) and 10 B.Eng candidates.

He had performed industry interactive research extensively with Calypto, Bluespec, BEECube, Huawei Canada during development of his Ryerson Design Space Exploration Tool arising from his Patent. For his excellence in doctoral research, he has been awarded/nominated by Ministry of Training, Colleges and Universities, Ontario for multiple years through OGS as well as by Ryerson University through GREA, RGA and NSERC ICA for many years. More about him can be found at: www.iiti.ac.in/~asengupt.
Area of Expertise: CE Hardware, IP Protection, Security and Reliability of CE IP Core.

Akihiko (Ken) Sugiyama

Topics:

Title: **30 Years of Audio Coding: -- How we arrived at audio playback on iPhone and its underlying technology**
Abstract: The 30-year history of audio coding technology. Focusing on MPEG Audio Coding.

Title: **History of Personal Media Terminals: From Walkman to Apple Watch**
Abstract: A brief history of personal media terminals, highlighting the development of the Silicon Audio, the world's first all solid-state audio player..

Title: **A to Z of signal enhancement when it is applied to consumer**
Abstract: products such as cellphone handsets, digital still cameras and camcorders, PCs and tablet computers, TV receivers, and gaming controllers.

Title: **Easy and Lazy Technical Writing for Engineers and Scientists**
Abstract: An easy and lazy way to prepare technical papers targeting at novices such as entry-level engineers and students. See GCCE2015/16 tutorials.

Bio:
Dr. Akihiko (Ken) Sugiyamahas been engaged in a wide variety of research projects in signal processing such as audio coding and interference/noise control. His team developed the world's first Silicon Audio in 1994, the ancestor of iPod. He served as Chair of Audio and Acoustic Signal Processing Technical Committee, IEEE Signal Processing Society (SPS) [2011-2012], as associate editors for several journals such as IEEE Trans. Signal Processing [1994-1996], as the Secretary and a Member at Large to the Conference Board of SPS [2010-2011], as a member of the Awards Board of SPS [2015-], and as the Chair of Japan Chapter of SPS [2010-2011]. He was a Technical Program Chair for ICASSP2012. He has contributed to 16 chapters of books and is the inventor of over 200 registered patents with more pending applications in the field of signal processing in Japan and overseas. He received 13 awards such as the 2002 IEICE Best Paper Award, the 2006 IEICE Achievement Award, and the 2013 Ichimura Industry Award. He is Fellow of IEEE and IEICE, and a Distinguished Lecturer in 2014 and 2015 for IEEE SPS.

Area of Expertise: Signal Processing (audio coding, signal enhancement such as echo and noise control, robot audition, technical writing, engineering education)