IBIS Open Forum Minutes

Meeting Date: **May 12, 2021**
Meeting Location: **IBIS Summit at IEEE SPI 2021 Virtual Workshop**

VOTING MEMBERS AND 2021 PARTICIPANTS

ANSYS	Curtis Clark*, Wei-hsing Huang*
Applied Simulation Technology	(Fred Balistreri)
Broadcom	(Yunong Gan)
Cadence Design Systems	Zhen Mu
Cisco Systems	(Stephen Scearce)
Dassault Systemes (CST)	Stefan Paret*, David Duque*, Longfei Bai*
Ericsson	(Guohau Wang)
Google	Zhiping Yang
Huawei Technologies	(Hang (Paul) Yan)
IBM	(Juan Martinez)
Infineon Technologies AG	(Christian Sporrer)
Instituto de Telecomunicações	(Abdelgader Abdalla)
Intel Corporation	Hsinho Wu, Michael Mirmak
Keysight Technologies	Radek Biernacki, Fangyi Rao
Marvell	Steve Parker
Maxim Integrated	Tushar Pandey
Micron Technology	Randy Wolff*, Justin Butterfield, Aniello Viscardi*
MST EMC Lab	(Chulsoon Hwang)
NXP	(John Burnett)
SerDesDesign.com	(John Baprawski)
Siemens EDA (Mentor)	Arpad Muranyi, Weston Beal*
Siemens AG	Franz Pfleger*, Sebastien Kollinger*
SiSoft (MathWorks)	Mike LaBonte*, Walter Katz
Synopsys	Ted Mido
Teraspeed Labs	Bob Ross*
Xilinx	(Romi Mayder)
ZTE Corporation	Bowen Shen*, Changgang Yin*, Dongdong Ye* Liqiang Meng*, Xiaoxuan Liu*
Zuken	Michael Schäder*
Zuken USA	Lance Wang

OTHER PARTICIPANTS IN 2021

Achronix Semiconductor	Hansel Dsilva
AVL Software and Functions	Wolfgang Röhrner*
Continental Automotive	Julnar Musmar*, Stefanie Schatt*

De Montfort University (IEEE EMC)	Alistair Duffy*
IT-Beratung-Maurer	Manfred Maurer*
Kandou Bus	Sherman Chen*
KEI Systems	Shinichi Maeda*
Luminous Computing	David Banas
Microchip Norway	Lars Snith*
Politecnico di Torino	Stefano Grivet-Talocia*, Paolo Manfredi*
	Alessandro Zanco*, Felipe Treviso*
	Marco Destefano*, Riccardo Trinchero*
	Tomasso Bradde*
RTC	Ken Whigham*
University of Illinois, Urbana	Jose Shutt-Ainé*, Xinying Wang*

In the list above, attendees at the meeting are indicated by *. Principal members or other active members who have not attended are in parentheses. Participants who no longer are in the organization are in square brackets.

UPCOMING MEETINGS
The connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting

Join with a video conferencing device
106010980@teams.bjn.vc
Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

Or call in (audio only)
+1 267-768-8015,,554664847#   United States, Philadelphia
Phone Conference ID: 554 664 847#
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All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

OFFICIAL OPENING
The IBIS Summit at IEEE SPI 2021 Virtual Workshop took place on Wednesday, May 12, 2021

as an online virtual meeting. About 36 people representing 18 organizations attended.

The notes below capture some of the content and discussions. The meeting presentations and other documents are available at:

https://ibis.org/summits/may21/

Start and stop times listed in these minutes refer to the meeting recording linked at:

https://ibis.org/summits/may21/summit_recording.mp4

Randy Wolff opened the summit by welcoming everyone and thanking them for joining. He thanked the organizers of SPI 2021 for working with IBIS to organize the summit.

(Start time: 0:00, End time: 1:00)

IBIS CHAIR'S REPORT
Randy Wolff (Micron Technology)

Randy Wolff provided a report on ongoing activities of the IBIS Open Forum. He shared a list of the new features (BIRDs) expected in the upcoming IBIS 7.1. He encouraged everyone to consider working with an IBIS task group and or drafting a BIRD if they had ideas for enhancements to IBIS.

(Start time: 1:30, End time: 17:00)

POWER INTEGRITY ANALYSIS FOR HIGH SPEED ASICS
Meng, Liqiang; Liu, Xiaoxuan (ZTE Corporation, China)
[Presented by Liu, Xiaoxuan (ZTE Corporation, China)]

Xiaoxuan Liu described some of the limitations, particularly in high current applications, of PDN design based upon a target impedance. She discussed some more realistic design and simulation scenarios based on characteristic impedance curves created using CPMs (chip power models).

(Start time: 18:00, End time: 30:00)

IEEE TRANSACTIONS ON SIGNAL AND POWER INTEGRITY
Alistair Duffy (De Montfort University) (President, IEEE EMC Society)

Alistair Duffy presented an introduction to the IEEE EMC Society's Fields-of-Interest. He then noted that the SI/PI community is not a subset of the EMC community, and there is a need for an archival central location for related SI/PI publications. He reviewed some data and survey results suggesting the potential for large readership and active participation in paper submission. The new IEEE Transactions on Signal and Power Integrity is expected to launch in

April of 2022, and they conservatively anticipate 20 papers in 2022, 25 papers in 2023, and 30 papers in 2024. He reviewed details, scope and sponsorship of the new publication. It is expected to be electronic format only and no printed version. Reviewed papers could be published as soon as they are approved. Alistair asked for feedback from the IBIS community's members on how they think they might contribute to this initiative.

(Start time: 30:45, End time: 57:45)

TIME DOMAIN MACROMODEL EXTRACTION
Ross, Bob (Teraspeed Labs, USA)

Bob Ross presented a review of some work on generating low-order rational function representations of transfer functions from time-domain measurement or simulation data. The presentation notes some lesser-known mathematical identities and some historical work of interest to modern researchers.

(Start time: 59:00, End time: 1:36:15)

SPICE MACROMODEL GENERATION
Ross, Bob (Teraspeed Labs, USA)

Bob Ross presented a process for generating SPICE macromodels based on cascaded building-block RLC pole and zero stages.

(Start time: 1:38:30, End time: 1:59:30)

RECENT DEVELOPMENTS ON ADVANCED MACROMODELING BY POLITECNICO DI TORINO
Bradde, Tommaso; De Stefano, Marco; Zanco, Alessandro; Grivet-Talocia, Stefano
(Politecnico di Torino, Italy)
[Presented by Grivet-Talocia, Stefano; De Stefano, Marco; Zanco, Alessandro; Bradde, Tommaso (Politecnico di Torino, Italy)]

Stefano Grivet-Talocia provided an overview of some current macromodeling research topics. Marco De Stefano presented work on efficient strategies for macromodeling of large-scale systems with hundreds of I/O ports. Alessandro Zanco presented work on more scalable and efficient multivariate parameterized macromodels. Tomasso Bradde presented work on small-signal modeling of non-linear analog circuit blocks.

(Start time: 2:01:00, End time: 2:45:30)

FREQUENCY-DEPENDENT PER-PORT RENORMALIZATION
Chen, Sherman*; Xu, Zhifei** (Kandou Bus, *UK, **Switzerland)

[Presented by Chen, Sherman (Kandou Bus, UK)]

Sherman Chen presented work on improving the accuracy of COM and other eye metrics by using frequency dependent termination impedances extracted for the Tx and Rx. He compared the results to those obtained with current industry standard techniques based on constant reference impedances for the Tx and Rx terminations.

(Start time: 2:45:45, End time: 3:09:00)

A PAM-4 BEHAVIORAL MODEL USING LAGUERRE-VOLTERRA FEED FORWARD NEURAL NETWORK AND ITS IMPLEMENTATION IN IBIS-AMI
Wang, Xinying; Nguyen, Thong; Shutt-Ainé, José (University of Illinois, Urbana, USA)
[Presented by Wang, Xinying (University of Illinois, Urbana, USA)]

Xingying (Vincent) Wang presented work on using a Laguerre-Volterra model to reduce the number of parameters in a representation of a high speed communication link. A Feed Forward Neural Network was used to train the parameters, and the resulting model was implemented in IBIS-AMI. Vincent also reviewed the ezAMI software he had created to help model makers create AMI models. A link to this tool exists on the IBIS free tools page (https://ibis.org/tools/).

(Start time: 3:09:30, End time: 3:39:00)

CLOSING REMARKS
Randy Wolff thanked the presenters, the organizers of SPI 2021, and the IBIS Board for a good summit. He thanked Bob Ross in particular for all the work organizing the summit, reviewing presentations, and putting together the agenda. Randy said we hope to see everyone in person again next year.

(Start time: 3:39:15, End time: 3:41:00)

NEXT MEETING
The next IBIS Open Forum teleconference meeting will be held on May 14, 2021. The following teleconference meeting is tentatively scheduled for June 4, 2021.

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NOTES

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This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.
- To subscribe to the official ibis@freelists.org and/or ibis-users@freelists.org email lists (formerly ibis@eda.org and ibis-users@eda.org).
- To subscribe to one of the task group email lists: ibis-macro@freelists.org, ibis-interconn@freelists.org, or ibis-quality@freelists.org.
- To inquire about joining the IBIS Open Forum as a voting Member.

- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: ibischk6, tschk2, icmchk1, s2ibis, s2ibis2 and s2iplt.

The BUG Report Form for ibischk resides along with reported BUGs at:

> http://www.ibis.org/bugs/ibischk/
> http://www.ibis.org/ bugs/ibischk/bugform.txt

The BUG Report Form for tschk2 resides along with reported BUGs at:

> http://www.ibis.org/bugs/tschk/
> http://www.ibis.org/bugs/tschk/bugform.txt

The BUG Report Form for icmchk resides along with reported BUGs at:

> http://www.ibis.org/bugs/icmchk/
> http://www.ibis.org/bugs/icmchk/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

> http://www.ibis.org/bugs/s2ibis/bugs2i.txt
> http://www.ibis.org/bugs/s2ibis2/bugs2i2.txt
> http://www.ibis.org/bugs/s2iplt/bugsplt.txt

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

> http://www.ibis.org/

Check the IBIS file directory on ibis.org for more information on previous discussions and results:

> http://www.ibis.org/directory.html

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SAE STANDARDS BALLOT VOTING STATUS

Organization	Interest Category	Standards Ballot Voting Status	March 12, 2021	April 02, 2021	April 23, 2021	May 12, 2021
ANSYS	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	X	-	X	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	-	X
Ericsson	Producer	Inactive	-	-	-	-
Google	User	Active	X	X	X	-
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
IBM	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	-
Keysight Technologies	User	Active	X	X	X	-
Marvell	Producer	Inactive	-	-	-	-
Maxim Integrated	Producer	Active	-	X	X	-
Micron Technology	Producer	Active	X	X	X	X
MST EMC Lab	User	Inactive	-	-	-	-
NXP	Producer	Inactive	-	-	-	-
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA (Mentor)	User	Active	X	X	X	X
SiSoft	User	Active	X	X	X	X
Synopsys	User	Active	X	X	X	-
Teraspeed Labs	General Interest	Active	X	X	X	X
Xilinx	Producer	Inactive	-	-	-	-
ZTE Corp.	User	Inactive	-	-	-	X
Zuken	User	Active	X	X	X	X

Criteria for SAE member in good standing:
- Must attend two consecutive meetings to establish voting membership
- Membership dues current
- Must not miss two consecutive meetings

Interest categories associated with SAE standards ballot voting are:
- Users - members that utilize electronic equipment to provide services to an end user.
- Producers - members that supply electronic equipment.
- General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations and associations, and/or consumers.