IEEE IAS Industrial Drives Committee
Minutes of the 2023 Annual Committee Meeting

ECCE 2023, Nashville, USA | Oct. 29-Nov.2, 2023
Tuesday, October 31, 2023, 2:00 pm – 3:00 am, CST

The following committee officers were present:
Luca Zarri, Chair of the IAS Industrial Drives Committee (IDC)
Jul-Ki Seok, IDC Vice-chair Papers
Kevin Lee, IDC Vice-chair Programs
Di Pan, IDC Secretary

1. Approvals of the Agenda and 2022 Meeting Minutes: (https://site.ieee.org/ias-idc/resources/)

The approvals of the agenda and 2022 meeting minutes were moved by Prof. Fabio Giulii Capponi, seconded by Prof. Pragasen Pillay, and unanimously approved.

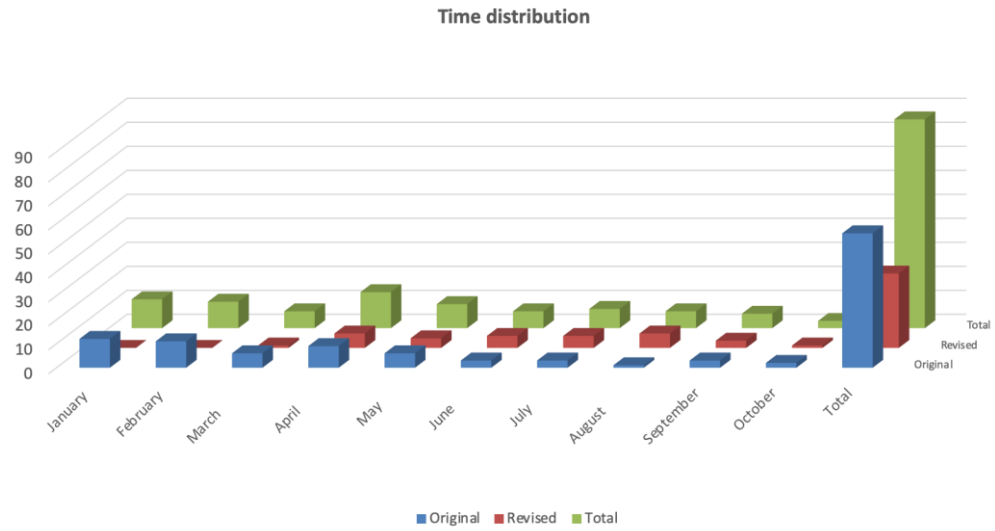
Prof. Luca Zarri acknowledged IEEE fellows and welcomed new members in the room. New members of the IDC introduced themselves.

2. Old Business and Reports

a. Vice-Chair Paper Review Report on Transactions Papers

Prof. Jul-Ki Seok presented the vice-chair papers report summarizing the statistics of the papers submitted to the IDC for publication in IEEE Transactions on Industry Applications.

- Total Number of Papers Submitted
  Between November 2022 and October 2023, the total number of original papers submitted for review is 76; this is higher than in 2022 (35% rise) and lower than in 2021 (56 and 95 submitted, respectively). Number of papers invited but not submitted is 18.
- Papers Submitted from Conferences Originally Presented. Submission from other conferences has increased by 133% compared to 2022.
- Time Distribution of the Submissions
  There are 64 original papers and 40 revised papers submitted for review.



- Papers Received based on Country of Origin

Between November and October 2023, the countries of the corresponding authors ranking from high to low were India (42 papers), Italy (12 papers), China (11 papers), Korea (the Republic of) (9 papers), United States (8 papers), Japan (5 papers), Norway (4 papers), Canada (3 paper), Portugal (3 paper), Australia (2 paper), Spain (2 paper), Greece (1 paper), Serbia (1 paper) and Turkey (1 paper).

- Accept/Reject Ratio and Days to Final Decision

Between January 2023 and October 2023, the acceptance ratio is 41.4% with 24 accepted papers, and 34 rejected papers. This ratio was 39.5% in 2022 and 50% in 2021. The median time from submission to the first decision is 74.1 days for 2023, 69.2 days for 2022 and 70 days for 2021. The mean time from submission to the final decision is 107 days in 2023, 109.3 days in 2022, and 105 days in 2021.

c. Review Report by the Vice-Chair for Programs

Dr. Kevin Lee presented the vice-chair programs report on the results at ECCE 2023.

- Vice Chairs
  - Kevin Lee (IDC)
  - David Diaz Reigosa (IDC)
  - Sara Roggia (IDC)
  - Ali Bazzi (PELS)
  - Antonio J. Marques Cardoso (PELS)
- Topic Chairs
  - Juan Guerrero
  - Sandro Rubino
  - Roberto Petrella
  - Giacomo Scelba
  - Di Pan
  - Prerit Pramod

- Ramakrishnan Raja
- Venkita Subramony
- Maria Martinez
- Marcello Pucci
- Mario Pulvirenti
- Arshiah Mirza
- Michele Mengoni
- Lei Hao
- Luca Vancini

■ Session Chairs

Track H has in total 5 oral sessions and 4 poster sessions. Two session chairs have been assigned to each session.

- Sneha Narasimhan
- Roberto Petrella
- Zhe Zhang
- Raja Ramakrishnan
- Nicola Bianchi
- Lei Hao
- Mohammed Agamy
- Michael Harke
- Marcello Pucci
- Maria Martinez Gomez
- Nidhi Haryani
- Mahesh Swamy
- David Diaz Reigosa
- Antonio J. Marques Cardoso
- Sara Roggia
- Ali Bazzi

Dr. Kevin Lee thanked all vice chairs, topic chairs and session chairs for their contributions.

■ IDC Digest Submissions

A total of 132 papers had been received under Electric Drives (13 sub-tracks), which is exactly the same as the number of digests submitted in 2022. The sub-tracks are reorganized from 2020's 13 sub-tracks. The sub-tracks are as follows with the number of submitted digests in the parenthesis:

1. General Electric Drives (6)
2. Induction Motor Drives (23)
3. PM and IPM Motor Drives (39)
4. Control of Electric Drives (5)
5. Sensorless drives (10)
6. Sensors and Transducers (14)
7. Diagnostics, Reliability and EMI (1)
8. High Speeds and Direct Drives (7)
9. Energy Efficient Motor Drives and Standards (9)
10. Medium Voltage and High-Power Drives (3)

11. New Technologies and Integrated Drives (13)
12. Electrical Drives for Aerospace and Traction Applications (2)
13. Electrical Drives for Wind & Other Renewable Integration (0)

PM and IPM Motor Drives had the highest submission number of 39, followed by Induction Motor Drives with 23, and Sensors and Transducers with 14, as the top three sub-tracks.

■ Yearly Submission Trends

There were 1712 ECCE submissions, up 19.5% compared to 2022 with 25 special session papers and 24 tutorial papers. At IDC, 132 digests were submitted, the same as in 2022.

■ 2023 Overall Statistics

Number of digests: 132
Number of papers withdrawn: 9
Number of papers accepted: 84
Number of papers rejected: 39

The acceptance ratio is 64% for 132 reviewed papers.
84 accepted papers were distributed into 9 technical sessions.

Review Quality:
All papers with at least 3 reviews
The average number of reviews per paper was around 4.0 (4.5 in 2022).

■ Submission by Country based on the First Author

There were 132 digests from 20 different countries. The submitted digests distribution by country based on the first author placed United States first (49), followed by Italy (18), China (17), Korea (7) and Spain (7).

■ Distribution of the Accepted Papers for the First Author

About 93% of the accepted papers come from United States (36), Italy (13), China (12), Spain (6), Korea (5), Germany (3) and Canada (3).

■ Relevant Statistics

The papers from industry in 2023 increased to 24 from 14 in 2022. The number was 19 in 2021, 17 in 2020, 24 in 2019, 32 in 2018 and 13 in 2017.

The acceptance rate for papers from industry is 67% in 2023 compared to 35.7% in 2022.

d. <u>IDC Standards Activity Update by the Subcommittee Chair</u>

IDC Standards Subcommittee Chair Dr. Mahesh Swamy presented updates from IEEE IAS P2943 Working Group, “Energy Efficiency Test Methods for Three-Phase Variable Frequency Drive Systems”.

■ Scope of Work:

This standard establishes a testing method for determining the energy efficiency of a motor drive system operating at varying load conditions. The standard will cover the drive system with

- The rated system voltage does not exceed 690Vac (line-line).
- Single or multiple drives fed from a common AC to DC rectifier or a DC source.
- All three-phase and multi-phase AC motors, including linear motors.
- Ancillary equipment, including input harmonic and/or EMI filters, output filter with long cable lengths, and step-up/down isolation transformer at input or output of drives.

■ Team Member

University:
Fernando Briz, Jiangbiao He, Eric Armando, Fang Luo, Zheyu Zhang
Industry:
Kevin Lee, Mahesh Swamy, Lei Hao, Di Pan, Jiangang Hu, Mohamad Koteich, Hassan Eldeen

■ P2943 Working Group Project Status:

Task	Document Section	Task Leader(s)	Completion Date	Status
1	General	Hassan	02/20/2023	Completed
2	System settings	Mahesh	05/22/2023	Completed
3	Test measurements	Fernando, Di	06/26/2023	Completed
4	Testing procedures of system thermal equilibrium	Mahesh, Hassan	06/26/2023	Completed
5	Testing procedures of multi-drive system	Mahesh, Fernando	Oct	
6	Load test schedule	Kevin, Jiangang, Lei, Di	July	Complete
7	Torque offset measurement	Eric, Jiangang, Mohamad	Oct	
8	System sub-System efficiency measurement	Lei Hao, Zheyu, Mohamad, JiangBiao	Nov	
9	Final Review			

The progress of the project is on track. 60% of the tasks are completed.

Due to a lack of participants (less than 6 people), the monthly group meeting was cancelled twice recently. Dr. Mahesh Swamy invited interested members to participate in standards subcommittee activities.

3. Awards and Recognitions

Dr. María Martínez from the University of Oviedo, Spain, is the Chair of the IDC Awards Subcommittee. Prof. Jul-Ki Seok presented the prize paper awards. This year, IDC has price paper awards for both ECCE and the transaction.

■ Awards Subcommittee:

- María Martínez, University of Oviedo - Spain (Chair)
- Prof. Alejandro Gomez Yepes (University of Vigo - Spain)
- Prof. Gianmario Pellegrino (Politecnico di Torino)
- Prof. Nicola Bianchi (University of Padova)

- Dr. Takashi Kato (Nissan Motor Co. Ltd)
- Dr. Michael Saur (Mercedes-Benz AG)
- Dr. Hassan Eldeeb (SLPT Automotive)
- Mrs. Ozge Taskin (Safran Group)
- Prof. Liliana De Lillo (University of Nottingham)

■ Review criteria for ECCE2022 Paper Awards and IDC Transactions Paper Awards
The review criteria included 6 specific quality indicators. A score from 0 to 10 was given for each of the parameters below.

- Readability (Is the paper easy to read? Do the conclusions follow from the data?).
- Use of Figures and Graphics (Do the figures and graphics clearly illustrate the data?)
- Novelty (Does the paper lead to a deeper understanding of the paper's subject? Does the paper lead to a new advanced knowledge of the paper's subject? Is it original?)
- Broad Interest (Is the paper's topic of interest outside of a narrowly targeted audience?)
- Significance (Is the paper's subject matter of significance in the paper's defined field of interest?)
- Impact (Will the paper have an impact on future research and development?)
    - The selection was based on the highest total scores. The highest-scored papers had to satisfy a threshold set for combined scores of the Significance, Impact parameters and Novelty.
    - The papers were ranked in decreasing order of Impact+Significance+Novelty. For the papers that had same score, a second rank considering also Readability+Figure Quality was used.

■ Procedure for 2022 ECCE Paper Awards
- Any IDC paper presented at ECCE 2022 was eligible for the IDC prize paper awards (the requirement that the papers must be submitted to IAS Transaction is no longer applicable).
- 20 papers were pre-selected based on the review score of the ECCE digests.
- IDC Award sub-committee reviewed the full paper version for the final selection.
- The review process rules included:
    - Two members of the Sub-Committee (one coming from university, one coming from industry) were asked to review 5 papers. The sub-committee member could choose to review any additional paper from the general list if he/she declared no conflict of interest.
    - The reviewers were assigned considering their nationality (the authors' nationality differed from the reviewer's).
    - Reviewers had to declare no conflict of interest for the papers assigned to them.
    - Papers authored by the same author were assigned to different groups of reviewers (if possible).
- The highest total scores were selected. All three papers satisfied a threshold set for the combined scores of the Novelty, Significance and Impact parameters.
- The papers were ranked in decreasing order of Impact+Significance+Novelty. A second rank considering Readability+Figure Quality was used for the documents with the same score.

■ Procedure for IDC Transaction Paper Awards
- A total of 51 papers recommended by IDC were published in the IEEE Transaction on Industry Applications in 2022 (Volume 58).

- The task of the IDC Awards Sub-Committee was to rank the best three papers.
- The review process rules included:

- Two members of the Sub-Committee (one coming from university, one coming from industry) were assigned to review 13 papers (one group was given 12 papers). The sub-committee member could choose to review any additional paper from the general list if they declared no conflict of interest.
- The reviewers were assigned considering their nationality (the authors' nationality differed from the reviewers').
- Reviewers had to declare no conflict of interest for the papers assigned to them.
- Papers authored by the same author were assigned to different groups of reviewers (were possible).
- One paper with the highest total and combined scores for the Significance and Impact parameters was recommended for the Transaction Paper Award.
- Three papers with the highest total scores were selected for the committee-level awards. All three papers satisfied a threshold set for the combined scores of the Novelty, Significance and Impact parameters.
- The papers were ranked in decreasing order of Impact+Significance+Novelty. A second rank considering Readability+Figure Quality was used for the documents with the same score.

■ 2022 IEEE ECCE Conference Paper Awards

The three Conference Paper Awards are:

First Prize Paper Award:

Fault Tolerant Operation of an LCI and VSI-fed Hybrid Induction Machine Drive for Medium Voltage High Power Applications

Authors:

Harikrishnan Pookulangara	Dept. of Electrical Engg, IIT Madras, Tamilnadu, India
Pratyush Pandey	Dept. of Electrical Engg, IIT Madras, Tamilnadu, India
Jose Titus	Dept. of Electrical Engg, IIT Hyderabad, Telangana, India
Kamalesh Hatua	Dept. of Electrical Engg, IIT Madras, Tamilnadu, India

Second Prize Paper Award:

Stable and Passive Observer-Based V/Hz Control for Induction Motors

Authors:

Lauri Tiitinen	Aalto University, Espoo, Finland
Marko Hinkkanen	Aalto University, Espoo, Finland
Lennart Harnefors	ABB Corporate Research, Västerås, Sweden

Third Prize Paper Award:

Three-Level Optimized Pulse Patterns With Reduced Common Mode Voltage

Authors:

Isavella Koukoula, Faculty of Inf. Technol. and Commun. Sciences, Tampere University, Tampere, Finland

Petros Karamanakos, Faculty of Inf. Technol. and Commun. Sciences, Tampere University, Tampere, Finland

Tobias Geyer ABB System Drives, ABB Switzerland Ltd, Turgi, Switzerland

■ 2022 Industrial Drives Committee Transactions Paper Awards

The three Transactions Paper Awards are:

First Prize Paper Award
Synchronous PWM Control With Carrier Wave Phase Shifts for Permanent Magnet Synchronous Motor
Authors:
Takafumi Hara, Shun Taniguchi, Toshiyuki Ajima, Masanori Sawahata, Masahiro Hori
Mobility Drive Systems Research Department, Hitachi, Ltd., Research and Development Group, Hitachi, Japan
Takaya Tsukagoshi, Powertrain Technology Development Department, Hitachi Astemo, Ltd., Hitachinaka, Japan
Katsuhiro Hoshino, System Design Department, Hitachi Astemo, Ltd., Hitachinaka, Japan

Second Prize Paper Award
Control of a Waveshaper-MMC With Thyristor-Based Front-End Converter for Open-End Winding Variable Speed Medium-Voltage Induction Motor Drive
Authors:
Shuvam Chakraborty Depart. of Electrical Engineering, IIT Kharagpur, Kharagpur, India
Suman Maiti Depart. of Electrical Engineering, IIT Kharagpur, Kharagpur, India

Dr. Luca Zarri presented the award to the authors. The IDC Committee congratulated the winners and members of the Awards Subcommittee for their excellent work.

- Associate Editors
  The IDC Vice Chair of Papers Prof. Jul-Ki Seok introduced the associated editors and thanked the associate editors for their contributions.
    - Davide Barater, University of Parma, Italy
    - Prerit Pramod, Nexteer Automotive Corporation, USA
    - David Díaz-Reigosa, University of Oviedo, SPAIN
    - Dinesh Kumar, Danfoss Drives Global R&D Center, Denmark
    - Giacomo Scelba, University of Catania, Italy
    - Wei Xu, Huazhong University of Science and Technology (HUST), China
    - Pinjia Zhang, Tsinghua University, China
    - Arijit Banerjee, University of Illinois at Urbana-Champaign, US
    - Peng Han, Ansys Inc, US
    - Fabio Immovilli, University of Modena and Reggio Emilia, Italy
    - Juan Manuel Guerrero Munoz, University of Oviedo, Spain
- Nagamori Awards Introduction by Yasushi Nishimura from Nagamori Foundation:
  Nagamori Foundation Mission Statement: Support research and development engineers in the technical fields of motors, power generators, actuators, and other related technologies.

  Nagamori Awards:
    - Commend those who have made innovative technological developments in the motor related technical fields.
    - Applicants must be entry to mid-career researchers and engineers.
    - It will be given to approximately six people. The Grand Nagamori Award winner will receive a prize of 5 million yen, and each of the Nagamori Award winners will receive 2 million yen.

  Application Guideline for the10th Nagamori Awards:

- Fields covered: Technical fields related to motors, actuators and power generators, and their control methods, application technologies, etc.
- Applicant eligibility: Applicants must be entry to mid-career researchers or development engineers who have made an outstanding achievement in the fields covered by the Nagamori Awards. Entry to mid-career – normally defined as no more than 30 years of research after obtaining the Bachelor's degree.
- Application method: Self-nomination or nomination from academic institutions are accepted. A recommendation letter by an expert in the field covered by the Awards, or a senior member of your Academic Society, organization, research department, etc. must be submitted.
- Application period: November 01, 2023-January 31, 2024. Applications must be postmarked on, or before, January 31, 2024.
- Application condition: Documents must be submitted in either English or Japanese.
- Awards & prizes: Nagamori Awards will be given to approximately six people. The winner of The Grand Nagamori Award will be announced during the Awards ceremony. The Grand Nagamori Award winner will receive a prize of 5 million yen, and each of the Nagamori Award winners will receive 2 million yen.

*The 10th Nagamori Awards Ceremony will be held on September 8, 2024 in Kyoto, Japan

Winners of The 8th Nagamori Awards:
Ke-Horng Chen
Chair Professor
Department of Electronics and Electrical Engineering/
Institute of Electrical and Control Engineering,
National Yang Ming Chiao Tung University

Juri Jatskevich
Professor
Department of Electrical and Computer Engineering, Faculty of Applied Science,
The University of British Columbia

Sangbae Kim
Professor Department of Mechanical Engineering,
Massachusetts Institute of Technology

Nobuyuki Kurita (*Grand Nagamori Award)
Associate Professor
Department of Surgery, Baylor College of Medicine/
Congenital Heart Surgery, Texas Children's Hospital

Sheldon Williamson
Professor and NSERC Canada Research Chair
Department of Electrical, Computer, and Software Engineering; Faculty of Engineering and Applied Science; Ontario Tech University

Junming Zhang
Professor, College of Electrical Engineering, Zhejiang University

4. New Business

- IDC Slate of Officers

  Dr. Mahesh Swamy presented the current IDC slate of officers.

  Chair: Prof. Luca Zarri, University of Bologna, Italy
  Vice Chair: Papers-Prof. Jul-Ki Seok, Yeungnam University, Korea
  Vice Chair: Programs-Dr.Kevin Lee, Eaton Corporation, USA
  Secretary: Secretary-Dr, Di Pan, Crane Aerospace & Electronics, USA
  Past Chair: Dr. Mahesh Swamy, Milwaukee Tool, USA

  Dr. Mahesh Swamy presented the nomination of 2024 IDC slate of officers.

  Chair: Prof. Prof. Jul-Ki Seok, Yeungnam University, Korea
  Vice Chair: Papers- Dr.Kevin Lee, Eaton Corporation, USA
  Vice Chair: Programs- Dr, Di Pan, Rivian Automotive, USA
  Secretary: Secretary-Prof. David Reigosa
  Past Chair: Prof. Luca Zarri, University of Bologna, Italy

  A short biography of Prof. David Reigosa is presented by Dr. Mahesh Swamy.

  - David Reigosa was born in Spain. He received the M.E. and Ph.D. degrees in Electrical Engineering from the University of Oviedo, Gijon, Spain, in 2003 and 2007, respectively.
  - Currently a Full Professor with the Electrical Engineering Department of the University of Oviedo, and Director for Sustainable Mobility at the Vice-rectorate for Sustainability, Mobility and Environment of the University of Oviedo.
  - Recipient of 9 IEEE Industry Applications Society Conference and IEEE Energy Conversion Congress and Exposition prize paper awards.
  - Recipient of the First Price from the Spanish Royal Academy of Engineers for his contributions to "Development temperature and magnetization stated techniques in synchronous machines" in 2019.
  - Served in scientific committees and as Vice Chair or Technical Program Chair of several conferences, including ECCE, ICEMS and SLED.
  - Senior member of IEEE, member of Industry Application Society and associate editor of IAS Transactions.
  - Research interests: electronic power converters and ac drives, machine design, monitoring and diagnostics, and digital signal processing.

  Dr. Mahesh Swamy moved the motion first, which was then seconded by Prof. Gianmario Pellegrino. The motion was unanimously approved.

- IEEE-IAS IPCSD DEIC (Diversity, Equity and Inclusion Committee)

  Committee newly created in February 2023 to promote and enhance DEI [Diversity, Equity and Inclusion] practices within IPCSD and its technical committees. Following the IEEE DEI guidelines, this committee will ensure that IPCSD pursues its technical objectives using

"the talents and perspectives of people with different personal, cultural, and disciplinary backgrounds". The subcommittee chair is Giovanna Oriti of Naval Postgraduate School.

- Submit Papers to IEEE Trans. on Ind. Applications
  In order to be considered for publication in Transactions or the Magazine, authors must present their work at an IAS sponsored conference and then request an invitation to submit a paper.To request an invitation, please send an email to the Publications Chair:
  - Jul-Ki Seok (doljk@ynu.ac.kr) – till December 31, 2023
  - Kevin Lee (Kevin_Lee@ieee.org) – from January 1, 2024

  A new on-line form has been developed to simplify the request for submission invitations. It will be available in November.
- Call for IDC Volunteers
  To revitalize our committee and involve the younger members in the IDC activities, we are looking for volunteers for the following aims:
  1. Promoting activities for student members and young professionals
  2. Liaison members with different IEEE regions and local IEEE chapters promoting cultural diversity and network building
  3. IDC representative for the IAS Webinar Committee
  4. IDC Webmaster
  5. IDC Special Activity Chair to promote new activities, such as journal special issues, special sessions at ECCE and other conferences.

- Introduction to ECCE 2024
  The details of ECCE 2024, which will take place in Phoenix, AZ, USA, October 20 - 24, 2023. (General Chair: Prof. Rolando Burgos), were presented by Prof. Luca Solero

- Recruit Topic Chairs and Session Chars for ECCE 2024

  IDC is looking for candidates: Send an email to Kevin Lee and Di Pan (by Nov. 30, 2023)

  kevin_lee@ieee.org , pandi@ieee.org

- Introduction to ICEM 2024
  The details of ICEM 2024 (50th anniversary edition) were presented by Prof. Gianmario Pellegrino. ICEM 2024 will take place in Torino, Italy, September 1 - 4, 2024. General Chair: Prof. Gianmario Pellegrino.

5. Adjournment

A call to adjourn the meeting was moved by Prof. Fabio Capponi, seconded by Prof. by Dr. Edison da Silva, and unanimously approved.

Submitted by Di Pan
Decemer 13, 2023