by Eric Monmasson

The 21st IEEE International Conference on Industrial Technology

The 21st IEEE International Conference on Industrial Technology (ICIT 2020) took place 26–28 February at the Buenos Aires Institute of Technology (ITBA), in the heart of Buenos Aires, the wonderful capital city of Argentina. The conference's chief sponsor was the IEEE Industrial Electronics Society (IES). The event was cosponsored by ITBA, the School of Engineering of the National University of La Plata, Argentina, IEEE Region 9, and the IEEE Argentina Section.

The conference included 12 technical tracks and six special sessions. We thank all those who contributed to the successful campaign that attracted so many excellent papers. The 12 technical tracks of the conference program were managed by Technical Program Committee cochairs Prof. Jorge Solsona, Prof. Antonio Luque, and Prof. Huijun Gao, who coordinated the work of the respective track chairs. Special Sessions cochairs, Prof. Cristian de Angelo, Prof. Luis Gomes, Prof. Marco Rivera, and Prof. Kim Man, carefully selected and managed special sessions (Figure 1). Their commitment to completing all the review process on time led to the timely notification to authors. As a result, from the nearly 350 papers received, 189 papers from 38 countries (9% from Argentina and 38% from South America) were included in the final program. Those papers were presented in 54 parallel sessions, including two oral interactive sessions (Figure 2).

The conference included two keynote speeches. Prof. Armando Colombo, from the University of Applied Sciences Emden/Leer, Germany, delivered "Engineering Industrial Cyber-Physical Systems. Digitalizing and Networking an Industrial Eco System using the DIN SPEC 91345 RAMI4.0." The keynote address by Prof. Santiago Barbero, from the National University of La Plata, Argentina, was "Energy Context in Argentina and the Current Status of Renewables" (Figure 3).

ICIT 2020 offered three tutorials on hot topics: "Data-Driven Cyber-Physical Resiliency of Electric Grid," by Dr. Anurag K Srivastava; "Electromagnetic Compatibility of Switched Mode Power Supplies," by Prof. Gunter Keller; and "Model Predictive Control of Power

FIGURE 1 – The ICIT 2020 Organizing Committee (from left): Prof. Cristian DeAngelo, Prof. Jorge Solsona, Juan José Rodríguez Andina, María Inés Valla, Miguel Aguirre, Nicolás Nemirovsky, Natalia Rey, and Cristina Nuñez.

FIGURE 2 – The oral interactive session on control and industrial applications.

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FIGURE 3 – The keynote speakers: (a) Prof. Armando Colombo and (b) Prof. Santiago Barbero.

Electronic Converters and Drives," by Prof. Ralph Kennel and Prof. José Rodríguez. Access to the tutorials was free of charge and available to all participants.

The ICIT 2020 program also featured very interesting parallel activities, such as the Student and Young Professionals (SYP) event held on 26 February and coordinated by Víctor Lifchitz. On 27 February, a Region 9 Workshop took place, coordinated by Yousef Ibrahim, IES vice president for Membership Activities. Analía Douthart coordinated a Women in Engineering (WiE) International Forum held that afternoon, which included talks by Prof. Morgan Kiani ("Woman in Power and Energy"), Georgina Sticco ("Why We Lose Women in STEM Careers and What is the Impact in the Industry and Society?"), and Laura Puricelli ("Is There any More Room for Process Automation on Content Supply Chain?").

A comprehensive cultural and social program included activities every day. Participants and their companions could enjoy a variety of activities.

- A cocktail reception and tango show with cultural singing were held on the evening of Wednesday 26 February. During the reception, the SYPs who received IES paper assistance to present their work were awarded their corresponding diplomas (Figure 4). After cocktails, all SYPs were invited to a party at La Birrería in Puerto Madero, a beer bar and restaurant in Buenos Aires that is popular with young people.

FIGURE 4 – The IES SYP Paper Assistance recipients (from left): Miguel Aguirre, María Inés Valla, Yousef Ibrahim, Shabnam Ruzbehi, Bita Arabsalmanabadi, Eduardo Matias Robador, Jitendra Kumar Goyal, Wenhua Ling, and Dmitri Vinnikov.

FIGURE 5 – The welcome breakfast at Estancia Santa Lucia on 28 February.

FIGURE 6 – The preparations for the traditional Argentine barbecue lunch.

- An exclusive wine tasting experience was offered on Thursday evening at a traditional Buenos Aires restaurant.
- Friday the 28th was a very special day in which all technical and social activities moved from ITBA to Estancia Santa Lucía. Buses departed from ITBA at 8:00 a.m. and all of the participants were welcomed at the Estancia with a cozy breakfast (Figure 5). At 10:00 a.m., the second keynote speech of the conference took place, immediately followed by the two parallel oral interactive sessions held in the gentle atmosphere of the countryside. Posters were printed and supplied by the

FIGURE 7 – The tango show.

FIGURE 8 – The ICIT 2020 invitees enjoying a horseback riding outing.

FIGURE 9 – The enthusiastic group of students from ITBA who helped the Organizing Committee in running the conference.

conference organization, minimizing travel inconveniences. At noon, there was a break to taste special meat and offal appetizers, then the interactive sessions resumed. A traditional Argentine asado (barbecue) lunch was served (Figure 6) followed by a show of traditional folk and tango dancing (Figure 7). Participants and companions also enjoyed horseback riding, which was a very popular activity (Figure 8).

ICIT 2020 is the first IES conference to be held in Argentina. We would like to thank all those who contributed to the success of this international event. We want to express our special thanks to the enthusiastic group of students from ITBA who helped us during the conference and the days leading up to it. Their work was essential to making everything run smoothly in a relaxed atmosphere (Figure 9). All people involved in organizing ICIT 2020 worked their hardest to offer participants an intellectually stimulating event, together with an enriching cultural experience in an enjoyable atmosphere. We hope to have achieved these goals and look forward to hosting the IES community again in Argentina for future events.

—María Inés Valla, Miguel Aguirre, and Juan José Rodríguez Andina
ICIT 2020 General Cochairs

Prof. Gopakumar and Prof. Zhang Deliver Lectures in L'Aquila, Italy

Prof. K. Gopakumar, IEEE Fellow from the Indian Institute of Science of Bangalore, India, delivered a Distinguished Lecture (DL) at the University of L'Aquila, Italy, on 23 September 2019 at the invitation of Prof. Carlo Cecati, chair of the Italy Chapter of the IEEE Industrial Electronics Society (IES) (Figure 1). His lecture was "Stacked Multilevel Inverter Topologies for Variable Speed Drive Applications" (Figure 2).

During the first part of his speech, Prof. Gopakumar summarized the state of the art in multilevel converter topologies, with special emphasis on their application in high-power, medium-voltage ac drives. The industry is still looking for some viable alternative to conventional inverters and to neutral-point-clamped three-phase inverters, aiming to limit power circuit complexity and to increase reliability for medium-voltage drive applications. Prof. Gopakumar then discussed, in depth, the recent work from his lab on five-, nine-, and 49-level inverter topologies with reduced dc link voltages for variable speed drive applications. Elimination of the common point voltage fluctuations due to the stacking of cells, with a normal six-phase intermediate modulation (IM) drive was also discussed.

FIGURE 1 – Prof. K Gopakuma (center), with Prof. Zhen Zhang (left), Prof. Carlo Cecati (right), and DL attendees at the University of L'Aquila, Italy.

FIGURE 2 – Prof. K. Gopakumar presenting his DL on the stacked multilevel inverter topologies for variable speed drive applications.

Prof. Gopakumar highlighted how multilevel inverters improve output voltage profile and reduce harmonic content and dv/dt. The conventional multilevel voltage space vector structure has a hexagonal profile, however, and it introduces the low-order fifth and seventh harmonics, especially in

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