FIGURE 2 – From left: Dr. Roberto Williams, ANCEFN president; Valla; and Dr. Raul Lopardo and Dr. Carlos Muravchik, members of the ANCEFN Engineering Section.

PROF. MARIA INES VALLA RECEIVED THE RECOGNITION AWARD FROM THE ARGENTINEAN ACADEMY OF SCIENCE.

granted to scientists who are younger than 40 and have made outstanding progress in their field of expertise. Valla's award was in the field of engineering sciences (Figure 1). She received it during a 15 November ceremony at the Buenos Aires National Academy of Medicine (Figure 2).

Bijnan Bandyopadhyay Delivers a Distinguished Lecture in Brazil

Prof. Jose Andres Santisteban, chair of the IEEE Industrial Electronics Society (IES)/Industry Applications Society/Power Electronics Society Joint Chapter, Rio de Janeiro Section, invited Prof. Bijnan Bandyopadhyay to deliver five Distinguished Lectures (DLs) in 2019 (Figure 1). Bandyopadhyay is a fellow of the Indian National Academy of Engineering and the National Academy of Sciences, Institute Chair Professor and head of the Systems and Control group at the Indian Institute of Technology Bombay, and a Fellow of the IEEE.

He delivered DLs on discrete-time sliding-mode control (SMC), output-feedback–based discrete-time SMC, terminal SMC and its discretized behavior, and a new concept, event-triggered SMC. The DLs were organized by Prof. Jose Paulo Vilela Soares da Cunha and Prof. Tiago Roux Oliveira, Rio de Janeiro State University. Approximately 40 people attended, 32 from Brazil, six from other Latin American countries, and two from Africa. An International Summer School on Sliding-Mode Control, on 8–12 April 2019, preceded the DLs.

FIGURE 1 – Bijnan Bandyopadhyay (left) meets with IES/Industry Applications Society/Power Electronics Society Joint Chapter officers.

Bandyopadhyay opened his 11 April lecture by reviewing the IES history, fields of interest, and activities (Figure 2). He also touched upon the major events organized by the IES as well as the Society's upcoming conferences and transactions and journals. He started his first technical lecture with an introduction to SMC in the discrete-time domain, which has received considerable attention since the introduction of the microprocessor and computer in control applications during the early 1980s. He emphasized that the first important observation in discrete-time SMC is that the exact SM cannot be achieved by using switching-based laws, as in the case of its continuous-time counterpart. He presented several methods of discrete-time SMC

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FIGURE 2 – Bijnan Bandyopadhyay summarizes the IES history and activities. The DL organizers, Tiago Roux Oliveira (far left) and Soares da Cunha (center), are shown.

FIGURE 3 – Bandyopadhyay begins one of his DLs.

FIGURE 4 – Approximately 40 people attend Bandyopadhyay's final lecture.

based on switching and nonswitching control laws.

In his second lecture (Figure 3), Bandyopadhyay explained that the complete solution of discrete-time SMC cannot be obtained by using only a multirate output-feedback technique and concluded that the method's results remove the bottleneck to real-world applications.

In his 12 April speech, Bandyopadhyay pointed out that during practical applications, such as multilink robotics, the manipulator states often must reach the origin within finite time. This can be achieved by using terminal SMC, a well-researched topic in the literature. During the lecture, he presented several methods for terminal SMC. He explained that the results of the discretization of continuous terminal SMC came as a surprise, a property which is not present in continuous-time terminal SMC.

In lecture four, Bandyopadhyay discussed a novel SMC implementation strategy: event triggering. In this methodology, he explained, the control must be updated whenever a certain stabilizing condition is violated. He added that this technique would be useful in spatially distributed control systems to reduce the communication among different sensor and actuator ends.

During his final lecture (Figure 4), he revisited integral SMC and presented a newly developed continuous integral SMC in which the discontinuous part is replaced by a super-twisting SM. He explained that the stabilization of a perturbed double integrator is not possible if a second-order observer is put in use. He also pointed out that in such a situation one has to resort to a third-order finite-time observer to solve the problem.

After each lecture, Bandyopadhyay conducted a question-and-answer session. He expressed his thanks to Prof. David Irwin, DL Committee chair, for approving the event and Soares da Cunha and Oliveira for their support during his stay at Rio de Janeiro.