



## Power Electronics Software Development and Testing Tools Workshop Hosted by ABB in Turgi, Switzerland

On 29 March 2019, the IEEE Power Electronics Society and Industrial Electronics Society (PEIESC) Joint Swiss Chapter hosted the Power Electronics Software Development & Testing Tools workshop on the premises of ABB in Turgi, Switzerland. The event's program chairs, Dr. Luca Dalessandro, group technology manager of the Schaffner Group, and PELS Chapter Chair Prof. Drazen Dujic, from École Polytechnique Fédérale de Lausanne, led the workshop.

Hardware-in-the-loop (HIL) was the subject of the workshop, since the HIL technique is receiving increasing attention among developers of complex embedded systems. However, there are controversial aspects of HIL that are still being debated such as the costs of HIL tools.

Five experts from companies offering software and hardware related to HIL participated in the event including Dr. Jost Allmeling from Plexim, Dr. Nicolas Cherix from Imperix, Christoph Schaub from Typhoon-HIL, Dr. Carlos Villegas from Speedgoat, and Vasco Lenzi from The MathWorks. Experts gave presentations on new technical solutions or projects of particular interest along with a question-and-answer session. The presentations are available on the website of the IES and PELS Chapter of the IEEE Swiss Section (<https://www.ieee.ch/chapters/ies/>).

The topics of the presentations included accurate subcycle average modeling, solutions for development stages of early and later control algorithms, examples and advances related to test automation, and rapid control prototyping for power electronics. The presentation session concluded with practical cases of control algorithm testing using the HIL technique directly from the field; Mathieu Giroux of ABB MV Drives and Erich Scheiben of ABB Traction Converters discussed the benefits and challenges of using the HIL method.

**THE HIL TECHNIQUE IS RECEIVING INCREASING ATTENTION AMONG DEVELOPERS OF COMPLEX EMBEDDED SYSTEMS.**

Afterward, a panel discussion (Figure 1) with the speakers was moderated by Dr. Wim van der Merwe, technology manager of ABB MV Drives. The presentation session and panel discussion were well attended. Participants included Dr. Wolfram Teppe, intellectual property manager, LEM Group and IEEE Chapter treasurer and past chair; and Dr. Gerard Scheuer, global R&D manager, ABB MV Drives, the company that hosted and sponsored the event (Figure 2). Discussion topics included the high investment cost for HIL and the

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FIGURE 1 – The HIL panel discussion moderated by (right) Wim van der Merwe. Sitting (from left): Christoph Schaub, Typhoon-HIL; Mathieu Giroux, ABB MV Drives; Jost Allmeling, Plexim; Erich Scheiben, ABB Traction Converters; Nicolas Cherix, Imperix; Vasco Lenzi, MathWorks; and Carlos Villegas, Speedgoat.

such as dedicated barrier and cascade photo detectors.

- Regarding imaging systems with above-megapixel formats, the pixel dimension plays a crucial role in determining critical system attributes, such as system size, weight, and power consumption. The advent of smaller pixels also results in superior spatial and temperature resolutions of imaging systems. The aforementioned topic is considered for the development trends of different types of FPAs—both thermal and photon detector arrays.
- THz technology is one of the emerging technologies that will change our

world. The THz region of the electromagnetic spectrum has proven to be one of the most elusive. Being situated between IR light and microwave radiation, THz radiation is resistant to the techniques commonly employed in these well-established neighboring bands. The last two comprehensive chapters contain new content devoted to THz detectors and imaging systems, including low-dimensional solids and graphene.

Each of the 28 chapters includes a rich separate list of references providing more than 2,000 classical and new positions. A large number of charts, table sets, and numerical examples

allow readers to understand and use this book. In summary, it is a type of encyclopedia that should be on the shelf of every researcher and practicing engineer who is interested in modern sensors and the design of sensor network systems.

—Marian P. Kazmierkowski,  
Warsaw University of Technology,  
Poland

## References

- [1] A. Rogalski, *Infrared Detectors*. Amsterdam, The Netherlands: Gordon and Breach, 2000.
- [2] A. Rogalski, *Infrared Detectors*, 2nd ed. Boca Raton, FL: CRC, 2011.



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FIGURE 2 – The invited speakers, graduate students, chairs of the IEEE IES and PELS Swiss Chapters, with the members and representatives from ABB MV Drives, the company that hosted and sponsored the event.

effort needed for the preparation of complex models as well as the benefits in automated testing and increased software quality.

Dr. Manfred Winkelkemper, global R&D manager of power electronics at the Schaffner Group stated, “It was an extremely interesting event because

both vendors’ and users’ perspectives have been presented. Concluding the discussion, any R&D team has to consider HIL today for improved throughput and quality in product development.”

The discussions provided a unique opportunity for participants to learn

more about advances in the HIL technique as well as understand the benefits and implications of using it in development.

—Dr. Luca Dalessandro  
IEEE Swiss Section IES Chapter Chair

