The Future Influence of Artificial Intelligence on Power Electronics and Renewable Energy

Brad Lehman
ECE Dept. Northeastern University, Boston, MA

The revolution in Artificial Intelligence is finally beginning to influence the power electronics and renewable energy fields. This talk will discuss its particular impact on areas like: power processing, power converter design, renewable energy operation, microgrids and other emerging application areas. For example: 1) smart PV panels have been built that can self-heal or reconfigure to produce higher power output when shaded or faulted; 2) Weather forecasts that utilize Deep Learning can be incorporated into energy management schedulers for solar photovoltaic microgrids to optimize profits; 3) Power electronic converter design algorithms may become automated in the future using machine learning approaches. However, the computational processing also requires huge demands on the power supply, especially when multiple GPUs are used. All these trends from AI have led to new technologies, problem statements, and control problems for the power electronics industry. These difficulties and opportunities will be discussed.